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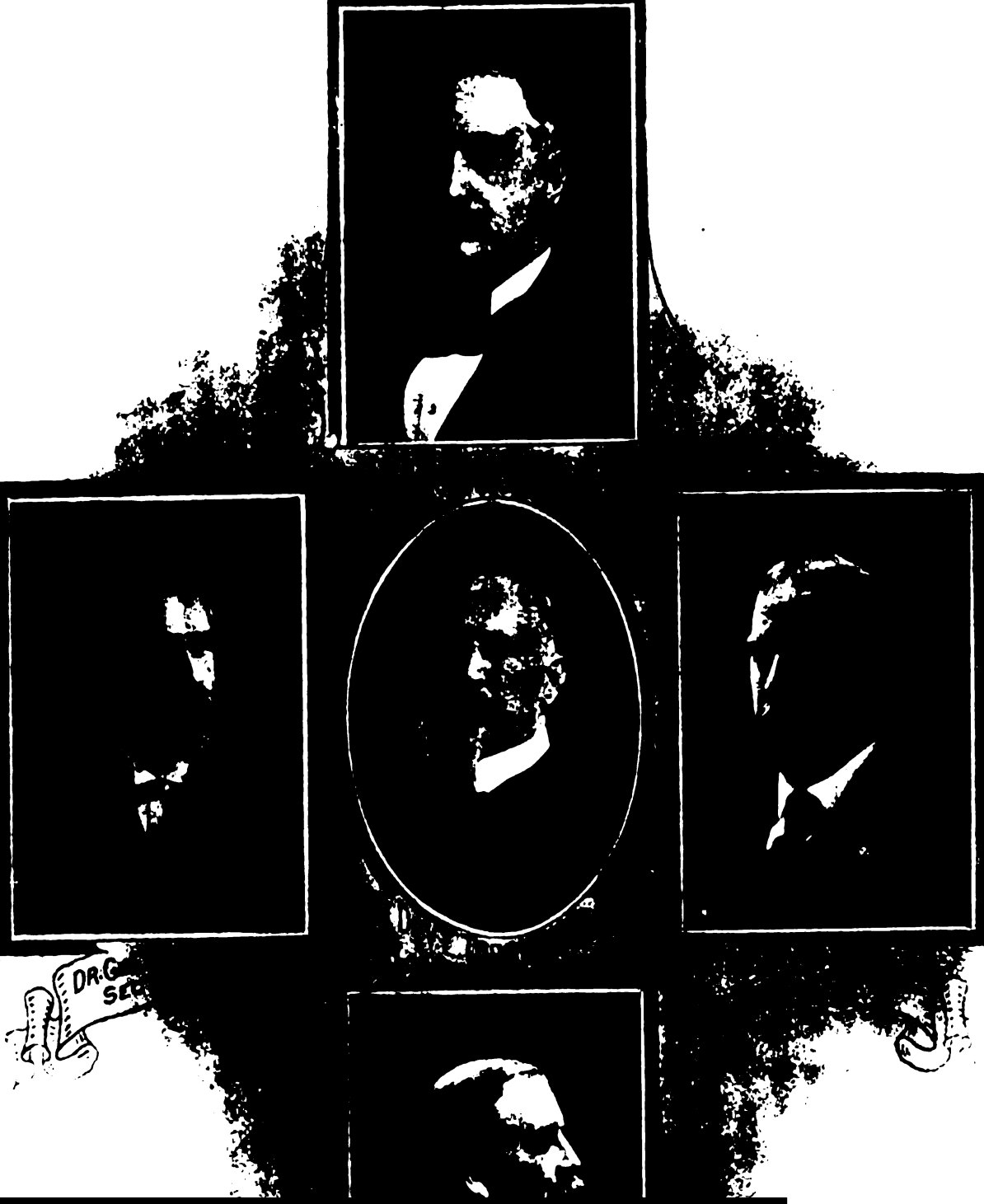

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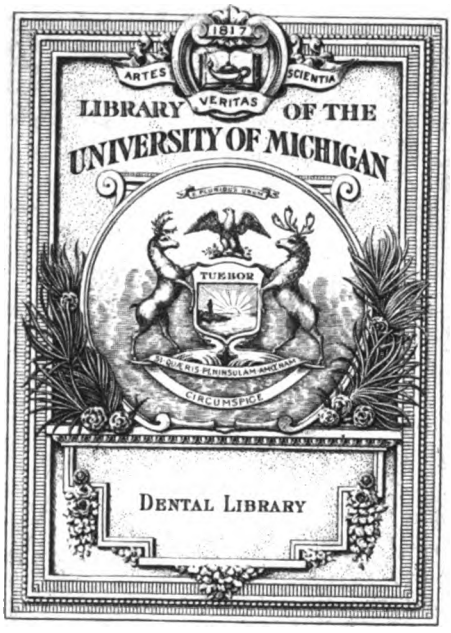

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Jamestown
ental Convention

NORFOLK, VIRGINIA
SEPTEMBER 10TH, 11TH AND 12TH, 1907

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JAMESTOWN EXPOSITION, NORFOLK, VA., 1907
Department of Congresses
Hon. HARRY ST. GEORGE TUCKER, President of Exposition
ROBERT H. SEXTON, Chief, Dep't of Congresses

TRANSACTIONS

OF THE

JAMESTOWN DENTAL CONVENTION

HELD AT

NORFOLK, VA.

September 10, 11, and 12, 1907

PHILADELPHIA
PRESS OF THE "DENTAL COSMOS"
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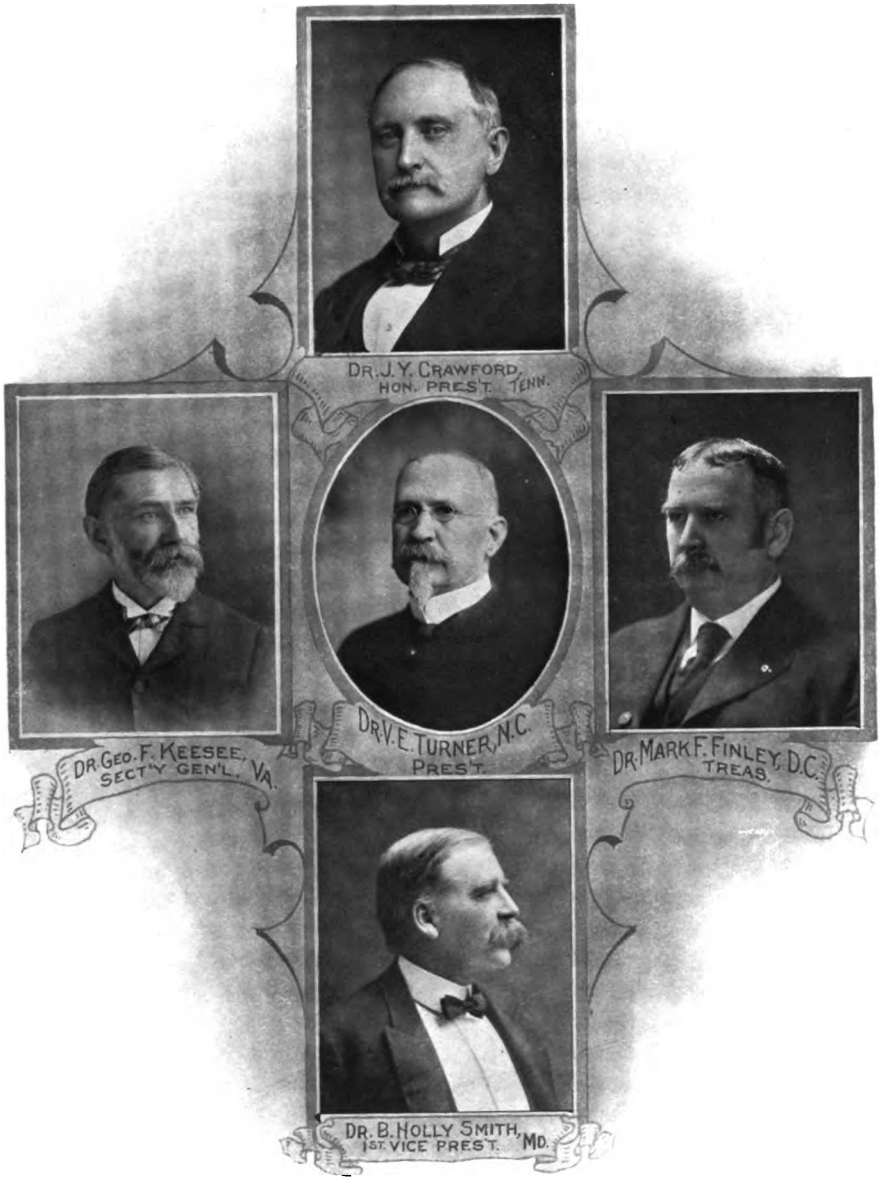

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SETTLES, J. R., Arkadelphia.
SMITH, EDGAR W., Little Rock.
THORNTON, W. A., Marianna.

California.

BAGBY, H. C., Santa Maria.
BEBB, WM., Los Angeles.
BENBROOK, C. M., Los Angeles.
COOK, J. FRANK, Los Angeles.
PEASE, J. L., Oakland.
SPARKS, FRANK, Los Angeles.
SPINKS, M. E., Los Angeles.

Colorado.

BURNS, F. D., Ouray.
DELBRIDGE, W. H., Greeley.

Connecticut.

BELL, L. C., Waterbury.
HINDSLEY, F., Bridgeport.
LOOMIS, WM. H., Rockville.
MCMANUS, JAS., Hartford.
MCMANUS, CHAS., Hartford.
MCMANUS, HENRY, Hartford.
MURLLESS, F. T., JR., Windsor Locks.
STILSON, I. B., Stamford.
TAYLOR, L. C., Hartford.

Delaware.

CLIFTON, R. H., Smyrna.
HITCH, G. A., Laurel.
JEFFERIS, C. R., Wilmington.
JOHNS, S. H., Wilmington.
JONES, R. H., Wilmington.

District of Columbia.

ALLEN, H. J., Washington.
BOWLES, S. W., Washington.
BOYNTON, G. W., Washington.
BRITTIN, R. C., Washington.
BROWN, G. R., Washington.
COGAN, W. N., Washington.
CUTHBERTSON, C. W., Washington.
DONNALLY, WMS., Washington.
ESKIN, J. S., Washington.
EVANS, P. W., Washington.
FINLEY, M. F., Washington.
HEYSER, W. T., Washington.
HOOFNAGLE, W. B., Washington.
LONDON, J. H., Washington.
MARSTELLER, A. A., Washington.
MITCHELL, F. A., Washington.
MACNAMEE, H., Washington.
PARSONS, S., Washington.
WEAVER, A. S., Washington.

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Florida.

Alderman, J. H., Gainesville.
Bowers, R. C., Gainesville.
Bryan, N. L., Lakeland.
Chase, James, Jacksonville.
Chace, J. E., Ocala.
Frink, C. H., Fernandina.
Houghton, F. H., Daytona.
Macey, R. H., West Palm Beach.
Mason, W. G., Tampa.
Nance, C. L., Tampa.
Pound, E. H., Jacksonville.
Sears, D. M., Mayo.
Taylor, R. P., Jacksonville.

Georgia.

Barnwell, C. M., Atlanta.
Bethea, W. L., Augusta.
Boughton, A. G., Savannah.
Cason, W. L., Cartersville.
Crenshaw, Thomas, Atlanta.
Crenshaw, William, Atlanta.
Eby, J., Atlanta.
Hinman, T. P., Atlanta.
Holmes, W. R., Macon.
Hughes, C. N., Atlanta.
Jackson, A. M., Macon.
Jewitt, H. R., Atlanta.
Johnson, H. H., Macon.
Lorenz, J. H., Atlanta.
Lovelace, G. R., Waycross.
McNeill, D. H., Athens.
Mason, R. H., Macon.
Miller, W. C., Augusta.
Rambo, S. D., Marietta.
Roach, Richard, Savannah.
Roux, R. H., Savannah.
Slaughter, N. G., Athens.
Stewart, W. H., Sylvester.
Summerlin, W. A., Dublin.
Tench, J. D. L., Senoia.
Tignor, G. S., Atlanta.
Walker, H. W., Macon.
Weichselbaum, Wm., Savannah.
Zirkle, W. M., Atlanta.

Idaho.

Lewis, J. H., Nez Perce.

Illinois.

Ames, W. V-B., Chicago.
Baldwin, D. H., Peoria.
Brophy, T. W., Chicago.
Crouse, J. N., Chicago.
Davis, H. E., St. Joseph.
McClure, T. H., Chicago.
McCallin, S. G., Chicago.
Moorehead, F. B., Chicago.
Peck, A. H., Chicago.
Stein, A., Chicago.
Taggart, W. H., Chicago.

Indiana.

Byram, J. Q., Indianapolis.
Hunt, George E., Indianapolis.
Jameson, A., Indianapolis.
Kahlo, H. C., Indianapolis.
Shryock, W. W., Fort Wayne.

Iowa.

Breene, F. T., Iowa City.
De Ford, W. H., Des Moines.
Finn, Wm., Cedar Rapids.
North, Gustavus, Cedar Rapids.
Reynard, Mae, Osceola.
Terry, W. M., Washington.

Kansas.

Hetrick, F. O., Ottawa.

Kentucky.

Feamster, J. H., Frankfort.
Howell, I. B., Paducah.

Louisiana.

Brasswell, R. R., Ruston.
Braud, O. L., Thibodaux.
Feltus, H. J., Baton Rouge.
Knapp, J. R., New Orleans.
Landry, J. H., New Orleans.
Vignes, C. V., New Orleans.
Woodward, J. E., New Orleans.
Zelinka, R. L., Houma.

Maine.

Bibber, W. R., Eastport.
Fellows, D. W., Portland.
Fogg, W. S., Cornish.
Haskell, A. W., Brunswick.
Kelley, H. A., Portland.
Miller, W. S., Fairfield.
Payson, W. S., Castine.
Soule, E. M., Unity.

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Maryland.

Baker, A. D., Keedysville.
Brewer, A. C., Baltimore.
Carleton, S. S., Baltimore.
Cruzen, E. E., Baltimore.
Deichmann, E., Baltimore.
Deichmann, G. L., Baltimore.
Dellinger, H. W., Lonaconing.
Finney, W. B., Baltimore.
Foster, W. G., Baltimore.
Foster, M. W., Baltimore.
Gingrich, C. M., Baltimore.
Grady, Richard, Annapolis.
Grieves, C. J., Baltimore.
Hardy, G. E., Baltimore.
Heatwole, T. O., Baltimore.
Kammer, C. W., Baltimore.
Keister, J. B., Crisfield.
Kelsey, H. E., Baltimore.
LeCron, S. L., Baltimore.
Matthews, C. V., Baltimore.
McCurdy, A. C., Towson.
Milholland, G. V., Baltimore.
Orrison, J. E., Baltimore.
Pennington, S. C., Baltimore.
Sadler, C. D., Baltimore.
Sadler, R. O., Baltimore.
Schlinkman, J. H., Baltimore.
Smith, B. Holly, Baltimore.
Smith, G. Marshall, Baltimore.
Smith, W. A., Denton.
Somers, R. T., Princess Ann.
Street, H. H., Baltimore.
Sykes, M. G., Ellicott City.
Sykes, S. C., Elkton.
Voight, W. T., Baltimore.
Waters, T. S., Baltimore.

Massachusetts.

Abbott, C. E., Franklin.
Andrews, R. R., Cambridge.
Boardman, W. E., Boston.
Hopkins, S. A., Boston.
Savage, G. E., Worcester.
Stanley, N. A., New Bedford.

Minnesota.

Gallagher, J. W., Winona.
Searl, A. C., Owatonna.
Wald, W. W., Jackson.
Wedelstaedt, E. K., St. Paul.

Mississippi.

Holloway, B. S., Brookhaven.
May, Ruel, Brandon.
Reaben, W. H., McComb.
Talbott, W. O., Biloxi.

Missouri.

Allen, C. C., Kansas City.
Bear, E. W., St. Louis.
Brown, W. E., St. Louis.
Cassel, H. F., St. Louis.
Conrad, Wm., St. Louis.
Dameron, E. P., St. Louis.
Darby, C. H., St. Joseph.
Franklin, F. W., Kansas City.
Greene, J. W., Chillicothe.
Haverstick, E. E., St. Louis.
Hull, J. W., Kansas City.
Hungerford, C. L., Kansas City.
Lawrenz, W. F., St. Louis.
LeCron, D. O. M., St. Louis.
McMillen, D. J., Kansas City.
Morris, J. D., Leadwood.
Patterson, J. D., Kansas City.
Renoe, W. H., Fulton.
Summa, Richard, St. Louis.
Thorpe, B. L., St. Louis.

Montana.

Hampton, T. M., Helena.
Long, E. A., Lewiston.

Nevada.

Phillips, T. H., Reno.

New Hampshire.

Blaisdell, E. C., Portsmouth.
Worthen, Jno. H., Concord.

New Jersey.

Brinkman, M. R., Hackensack.
Carter, Jno., Newark.
Gifford, T. I., Woodbury.
Holbrook, C. W. F., Newark.
Hull, H. A., Brunswick.
Irwin, A., Camden.
Pruden, Wm. H., Patterson.
Rood, V. D., Morristown.
Roberts, Chas. B., Jersey City.
Slade, S. C., Vineland.
Woolsey, Walter, Elizabeth.

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New York.

Brown, E. Parmly, New York.
Burkhart, A. P., Buffalo.
Burkhart, H. J., Batavia.
Carr, Wm., New York.
Chayes, H. E. S., New York.
Colgrove, W. H., Johnstown.
Ferris, H. C., Brooklyn.
Fossume, F. L., New York.
Freeman, S. A., Buffalo.
Garden, E. D., Tarrytown.
Griswold, R. H., New York.
Harlan, A. W., New York.
Hutchinson, R. G., Jr., Brooklyn.
Jackson, V. H., New York.
Lamb, G. E., Port Henry.
Manney, G. A., New York.
Ottolengui, R., New York.
Palmer, Stephen, Poughkeepsie.
Pritchard, M. H., New York.
Ryan, C. M., Syracuse.
Siqueland, Theo., Brooklyn.
Short, W. B., New York.
Stanton, F. L., New York.
Taylor, J. W., New York.
Van Woert, F. T., Brooklyn.
Walker, W. W., New York.

North Carolina.

Alexander, C. L., Charlotte.
Bender, O. J., Pollocksville.
Betts, J. S., Greensboro.
Bland, C. A., Charlotte.
Booth, R. S., Warrenton.
Breder, J. H., Wilmington.
Brooks, J. H., Burlington.
Carr, I. N., Durham.
Carroll, N. G., Raleigh.
Conrad, W. J., Winston-Salem.
Dameron, L. L., Jr., Newberne.
Davis, I. H., Oxford.
Durham, B. J., Asheville.
Edmundson, J. R., Wilson.
Everitt, D. E., Raleigh.
Fleming, A. H., Louisburg.
Fleming, J. M., Raleigh.
Frazier, A. E., High Point.
Gorham, L. R. Rocky Mount.
Gorman, J. A., Asheville.
Harris, F. S., Henderson.
Harris, M. M., Elizabeth City.
Hartsell, W. K., Randelman.
Hawkins, T. M., Sandy Ridge.
Henderson, S. V., Oxford.
Herring, G. F., Mt. Olives.
Hillard, S. P., Rocky Mount.
Horton, H. V., Winston-Salem.
Horton, P. E., Winston-Salem.
Houston, W. C., Concord.
Hunt, F. L., Asheville.
Ihrie, J. H., Pittsboro.
James, D. L., Greeneville.
Jones, R. H., Winston.
Jamieson, I. W., Charlotte.
Lockhart, D. K., Ashboro.
McCracken, J. T., Durham.
Marrow, R. M., Burlington.
Meador, J. R., Reidsville.
Perkins, F. E., High Point.
Perry, E. A., Littleton.
Regan, C. W., Laurinburg.
Reid, J. G., Marion.
Riddick, C. R., Ayden.
Shackelford, E. W., Durham.
Sherrill, R. G., Raleigh.
Smathers, Wexler, Asheville.
Spargeon, J. S., Hillsboro.
Stephens, R. W., Apex.
Thompson, C. A., Wilson.
Tucker, E. J., Roxboro.
Turner, V. E., Raleigh.
Van Nappen, J. J., Spray.
Waller, R. F., Sanford.
Walters, H. N., Warrenton.
Ward, W. J., Weldon.
Watkins, J. C., Winston-Salem.
Wheeler, J. H., Greensboro.
White, J. H., Elizabeth City.
Whitsell, G. W., Greensboro.

Ohio.

Ainsworth, H. S., Van Wert.
Ambler, H. L., Cleveland.
Bethel, L. P., Columbus.
Brown, H. C., Columbus.
Custer, L. E., Dayton.
Fletcher, M. H., Cincinnati.
Hamm, W. G., Chillicothe.
Hawley, C. A., Columbus.
Jenkins, H. E., Ironton.
Kriss, George, Cleveland.
Longfellow, J. C., Bellefontaine.
Musgrove, A. C., Ohio City.
Ruggles, S. D., Portsmouth.
Smith, W. P., Cleveland.
Strong, H. F., Cleveland.

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VAN DEMAN, W. H., Toledo.
WARNER, J. P., Canal Winchester.
WILSON, GEORGE H., Cleveland.

Oklahoma.

LONG, S. A., South McAlester.
REYNOLDS, M. S., Foss.
WRIGHT, J. E., South McAlester.

Oregon.

NOTTAGE, GEO. H., Portland.

Pennsylvania.

BACHMAN, C. A., Emaus.
BAIR, J. T., Reading.
BOHN, H. W., Reading.
CAPON, W. A., Philadelphia.
CASTO, T. D., Philadelphia.
CLEAVER, H. L., Reading.
COCHRAN, G. W., Erie.
FAUGHT, L. A., Philadelphia.
GASKILL, J. H., Philadelphia.
GRIM, C. E., Reading.
GUILFORD, S. H., Philadelphia.
HAMAKER, H. B., Womelsdorf.
HERTZ, J. C., Easton.
HICKMAN, H. B., Philadelphia.
HITCH, D. M., Philadelphia.
INGLIS, O. E., Philadelphia.
JARMAN, A. W., Philadelphia.
JONES, V. S., Bethlehem.
LITCH, W. F., Philadelphia.
LUCKIE, S. B., Chester.
MCFADDEN, H. B., Philadelphia.
MIDDAUGH, W. C., Easton.
O'FARRELL, J. T., Philadelphia.
REGISTER, H. C., Philadelphia.
ROBERTS, H. E., Philadelphia.
ROE, W. J., Philadelphia.
SCHLEGEL, G. S., Reading.
SCHUPACK, C. B., Philadelphia.
TRUEMAN, W. H., Philadelphia.
TURNER, C. R., Philadelphia.
WARD, J. E., Bellefonte.

Rhode Island.

DILL, M. B., Providence.
ESTES, N. A., Newport.
FITZGERALD, C. W., Pawtucket.
GORMLEY, F. P., Providence.
HEFFERN, P. J., Pawtucket.

South Carolina.

BIGHAM, J. B., Chester.
CORLEY, A. H., Edgefield.
DOTTERER, L. P., Charleston.
FERGUSON, FRANK, Greenville.
GARRETT, J. F., Gaffney.
GILMAN, F. C., Columbia.
GOLDBERG, E. H., Bennettsville.
GUNTER, W. K., Clifton.
HAIR, H. B., Union.
HARDING, G. R., Newberry.
JOHNSTONE, A. P., Anderson.
MOORE, T. T., SR., Columbia.
PRESSLEY, W. A., Rock Hill.
QUATTLEBAUM, E. G., Columbia.
RAY, H. J., Aiken.
RUTLEDGE, BROOKS, Florence.
SIMPSON, I., Rock Hill.
STRICKLAND, A. C., Anderson.
TROTTI, L. H., Cheraw.

South Dakota.

LAMME, R. J., Mitchell.
WILLIAMS, O. H., Springfield.

Tennessee.

BARNETT, A., Memphis.
BOYD, J. J., Covington.
BRABSON, B. D., Knoxville.
COLE, J. M., Dyersburg.
COTTRELL, A. J., Knoxville.
CRAWFORD, J. Y., Nashville.
MEACHAM, F. W., Chattanooga.
MELENDY, A. R., Knoxville.
PEETE, CHAS., Memphis.
SLATER, W. K., Knoxville.
THOMPSON, J. W., Memphis.
TOWNER, J. D., Memphis.
WALKER, W. G., Milan.
WIGGINS, F., Knoxville.

Texas.

BRAY, B. B., Waco.
BUCHANAN, J. L., Bonham.
CARROLL, R. W., Beaumont.
DAVID, J. W., Corsicana.
DAVISON, H. M., Hubbard.
GRIFFIS, R. D., Paris.
HALL, J. W., Shamrock.
HARRELL, H. B., Gainesville.
HARRELL, C. N., Amarillo.

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JENKINS, J. V., Bonham.
KLEINECK, L. C., Cuero.
MERCHANT, M. S., Houston.
PORTWOOD, J. J., Hereford.
ROSE, F. M., Del Rio.
STAPLES, G. S., Sherman.
STAPLES, G. W., Dallas.

Utah.

STIEHL, G. F., Salt Lake City.

Virginia.

ADAMS, W. P., Scottsville.
AMES, W. C., Smithfield.
APPLEWHITE, E. J., Newport News.
BARRETT, R. M., Norfolk.
BEADLES, E. P., Danville.
BLACKMORE, E. C., Hampton.
BLOXTON, BENJAMIN, Richmond.
BRIDGEFORTH, B., Richmond.
BYRD, O. F., Portsmouth.
CAMPBELL, H. W., Suffolk.
CAMPBELL, J. H., Lexington.
COPENHAVER, E. M., Marion.
COSTENBADER, F. L., Richmond.
COSTENBADER, J. H., Berkley.
COWARDIN, L. M., Richmond.
COWARDIN, W. J., Richmond.
CROZIER, T. W., Christiansburg.
DAVIS, H. E., Williamsburg.
DAVISON, G. J., Richmond.
EGGLESTON, EDWARD, Richmond.
EGGLESTON, J. W., Richmond.
EPES, J. S., Emporia.
EWALD, W. H., Portsmouth.
FIELD, M. C., Petersburg.
FRENCH, N. B., Clintwood.
GIFFORD, C. B., Norfolk.
GROVE, B. O., Berryville.
HALLER, W. H., Portsmouth.
HARMAN, URIAH, Richmond.
HARPER, C. E., Danville.
HARRIS, F. L., Harrisonburg.
HODGKIN, F. C., Warrenton.
HILL, J. P., Marion.
HODGKINS, J. O., Warrenton.
HOLLAND, L. C., Suffolk.
HUBBARD, T. D., Lynchburg.
JONES, RICHARD, Norfolk.
JONES, W. A., Waynesboro.
KEESEE, G. F., Richmond.
LANE, G. F., Suffolk.
LEE, E. G., Norfolk.
LEE, F. A., Lynchburg.
LESTER, B. A., Norfolk.
LEWIS, J. M., Richmond.
LEWIS, R. C., Culpeper.
LONGAN, F. B., Newport News.
LOVELACE, W. S., Houston.
MCANALLY, S. A., Richmond.
MCCLURE, F. W., Lexington.
MCGEHEE, W. H. O., Richmond.
MADDOX, H. W., Fincastle.
MANNING, J. W., Norfolk.
MERCER, C. A., Richmond.
MOSELEY, W. H., South Boston.
NEWLAND, C. A., Wytheville.
NIXON, W. G., Hillsboro.
NORRIS, W. E., Charlottesville.
OLIVER, G. H., Irvington.
PEARSON, W. H., Hampton.
PENNINGTON, R. B., Elkton.
PILCHER, L. D., Petersburg.
PILCHER, WM., Petersburg.
PRESSEY, B. J., Newport News.
PRESSEY, J. B., Hampton.
QUISENBERRY, H. M., Buena Vista.
REED, J. F., Norfolk.
RENALDS, W. R., Salem.
ROBINSON, R. L., Newport News.
RUDD, M. B., Richmond.
SAVAGE, W. H., Clifton Forge.
SIMPSON, R. L., Richmond.
SMITH, H. L., Charlottesville.
SMITH, I. B., Richmond.
SMITH, J. P., Martinsville.
SMITH, W. O., Louisa.
SNIPES, W. E., Franklin.
SPRINKLE, A. H., Staunton.
STIFF, F. W., Richmond.
STIFF, J. P., Fredricksburg.
STITH, W. M., Petersburg.
STORES, W. A., Portsmouth.
STRATFORD, A. L., Richmond.
STREET, W. H., Richmond.
STURGIS, WM., Norfolk.
STYNE, M. F., Roanoke.
SYDNOR, T. L., Danville.
TALLEY, F. R., Petersburg.
TUCKER, L. C., Blackstone.
UMBERGER, E. W., Wytheville.
WALKER, J. L., Norfolk.
WALKER, L. G., Emporia.
WALKER, R. H., Norfolk.
WARD, S. B., Belle Haven.
WHITE, E. S., Norfolk.
WIDGIN, W. B., Franktown.
WILLIAMS, W. D., Cape Charles.

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WILSON, D. G., Richmond.
WOMACK, C. T., Martinsville.
WOOD, W. W., Richmond.
WOOL, J. H., Norfolk.
WORD, L. E., Pocahontas.
WRIGHT, E. P., Richmond.
YATES, P. P., Bedford City.

Washington.

IRWIN, C. E., Vancouver.
ROSE, C. L., Spokane.
SHAW, F. I., Seattle.

West Virginia.

BARTLETT, C. H., Parkersburg.
BLACK, F. L., Bluefield.
EPLING, G. T., Keystone.
HILL, E. B., Marlinton.
HUTCHINSON, I. W., Parkersburg.
KEAN, J. L., Ronceverte.
WRIGHT, F. L., Wheeling.

Wisconsin.

BLASS, EDWIN J., Portage.
HARDGROVE, T. A., Fond du Lac.

FOREIGN.

Australia.

WRIGHT, A. J., Perth.

Austria.

JACOBOWSKI, KAROL, Lemberg.

Canada.

CAPON, F. J., Toronto.
LEIGHTON, G. T., St. John.
MCTAVISH, W., Toronto.
TRIGGER, T. C., St. Thomas.

Cuba.

WEBER, A. G., Havana.

England.

LECRON, R. N., London.

France.

ETCHEPAREBORDA, N., Paris.
PLATSCHICK, B., Paris.

Germany.

HAYDEN, GILLETTE, Dresden.
PFLUGER, M., Hamburg.

Hawaii.

DERBY, A. J., Honolulu.
HUTCHINSON, E. L., Honolulu.

Mexico.

MOORE, J. F., Saltillo.
PAZ, E., Mexico City.

Nova Scotia.

O'BRIEN, G. W., Amherst.

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PROGRAM.

Tuesday, September 10, 1907.

OPENING EXERCISES.

Convention Hall (Exposition Grounds),

9.30 A.M.

Meeting called to order by Dr. BURTON LEE THORPE, St. Louis, chairman of the Committee on Organization.

Invocation—Rev. Dr. C. L. BANE, pastor Memorial M. E. Church, Norfolk, Va.

Address of welcome—Hon. HARRY ST. GEORGE TUCKER, president of the Jamestown Exposition Company.

Address of welcome—Dr. JOSEPH W. EGGLESTON, Richmond, Va., in behalf of the profession of Virginia.

Address of welcome—Dr. EDWARD EGGLESTON, Richmond, Va., president of the Virginia State Dental Association.

Address of welcome—Dr. W. G. MASON, Tampa, Fla., president of the Southern Branch of the National Dental Association.

Address of welcome—Dr. J. Y. CRAWFORD, Nashville, Tenn., honorary president of the Jamestown Dental Convention. In behalf of the profession of the South.

Response to the addresses of welcome—Dr. J. D. PATTERSON, Kansas City, Mo.

Address by the President—Dr. V. E. TURNER, Raleigh, N. C.

2.30 P.M.

Clinics in Convention Hall—Dr. Clarence J. Grieves, *Chairman*, Baltimore, Md.

8.00 P.M.

Smoker at Inside Inn—Dr. B. Holly Smith, *Chairman*, Baltimore, Md.

Wednesday, September 11th.

Illustrated lecture—Dr. F. T. VAN WOERT, Brooklyn, N. Y.: "Is the Cemented Filling the Filling of the Future?"

Discussion opened by Dr. WM. K. SLATER, Knoxville, Tenn., and Dr. CRAIG M. WORK, Ottumwa, Iowa.

Illustrated lecture—Dr. CHAS. L. ALEXANDER, Charlotte, N. C.: "Gold Inlays."

Discussion opened by Dr. H. HERBERT JOHNSON, Macon, Ga., and Dr. J. G. FIFE, Dallas, Texas.

Illustrated lecture—Dr. R. OTTOLENGUI, New York City: "The Purposes and Accomplishments of Modern Orthodontia."

Discussion opened by Dr. W. O. TALBOT, New Orleans, La., and Dr. HENRY W. MORGAN, Nashville, Tenn.

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Thursday, September 12th.

Special clinical lecture and demonstration—Dr. Wm. H. Taggart, Chicago, Ill.: "Cast Gold Inlays, Bridges and Plates."

Discussion opened by Dr. J. H. Lorenz, Atlanta, Ga., and Dr. L. E. Custer, Dayton, Ohio.

8.00 P.M.

Entertainment given to members and guests of the Convention by the Virginia State Dental Association, under the chairmanship of the association's president, Dr. Edward Eggleston, Richmond, Va.

CLINICS.

Tuesday, September 10th.

2.30 P.M.

CHAIR CLINICS.

Pyorrhea.

T. A. Hardgrove, D.D.S., Fond du Lac, Wis. "Pyorrhea Alveolaris with Tooth-Replantation."

Crowns and Bridges.

Thos. H. McClure, D.D.S., Chicago, Ill. "Some Advantages of All-Carved Porcelain Crowns for the Posterior Teeth."

Porcelain and Gold Inlays.

John Q. Byram, D.D.S., Indianapolis, Ind. "Anterior Porcelain Inlay."

F. T. Van Woert, D.D.S., Brooklyn, N. Y. "Porcelain Work."

D. H. Baldwin, D.D.S., Peoria, Ill. "A Porcelain Restoration—Brewster's Bodies."

Chas. L. Rose, D.D.S., Spokane, Wash. "Gold Inlay."

TABLE CLINICS.

Crown and Bridge Work.

H. E. Jenkins, D.D.S., Ironton, Ohio. "Porcelain Crowns and Bridges."

Richard L. Simpson, A.M., D.D.S., Richmond, Va. "Some Positive Results in Color and Soldering."

A. W. Jarman, D.D.S., Philadelphia, Pa. (a) "Crown and Bridge Work: Fixed—Movable." (b) "Bridges and Crowns Without Solder."

Henry J. Feltus, D.D.S., Baton Rouge, Louisiana. "A New Anterior Abutment."

H. E. S. Chayes, D.D.S., New York City. "Removable Bridge Work."

Emerson Sausser, D.D.S., Philadelphia, Pa. "A Practical Method of Obtaining Platinum Matrices for Porcelain Inlays."

Gustavus North, D.D.S., Cedar Rapids, Iowa. "Replacing Porcelain Facings Without Removing Crown or Bridge from the Mouth—Quick Method."

J. H. Lorenz, D.D.S., Atlanta, Ga. "Detailed Construction of Hood Abutments."

Wm. W. Wold, D.D.S., Jackson, Minn. "A New Removable Facing for Crown and Bridge Work."

Richard Blum, D.D.S., New York City. "Removable Bridge, Gold Inlay Abutments, Combination Teeth."

Edward Eggleston, D.D.S., Richmond, Va. "A Modification in Bridge Work."

W. R. Renalds, D.D.S., Salem, Va. "Bridge Work."

A. P. Burkhart, M.D.S., Buffalo, N. Y. "Steele's Interchangeable Facings."

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HOWARD T. STEWART, D.D.S., Memphis, Tenn. "Lock Shoulder Crown for Abutment for Bridge Work in Riggs' Disease Cases."

D. H. MCNEILL, D.D.S., Athens, Ga. "A Simple Method of Restoring a Broken Porcelain Facing."

J. C. LONGFELLOW, D.D.S., Bellefontaine, Ohio. "A Bandless Richmond Crown."

E. DE WITT GARDEN, D.D.S., Tarrytown, N. Y. "A New Facing for Bridge Work."

A. P. JOHNSTON, D.D.S., Anderson, S. C. "A Simple and Very Satisfactory Method of Fitting Porcelain Crowns to Roots."

WM. B. SHORT, D.D.S., New York City. "A Replaceable Facing for Bridge Work."

W. A. CAPON, D.D.S., Philadelphia, Pa. "Carving as Applied to Porcelain Crown Work."

THOS. P. HINMAN, D.D.S., Atlanta, Ga. (Subject selected.)

Wednesday, September 11th.

2.30 P.M.

CHAIR CLINICS.

Metal and Other Filling Operations.

(Section of the G. V. Black and Wedelstaedt Dental Clubs will operate consecutive days and will be assisted by their private practice assistants.)

WM. FINN, D.D.S., Cedar Rapids, Iowa. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

J. W. S. GALLAGHER, D.D.S., Winona, Minn. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

A. C. SEARL, D.D.S., Owatonna, Minn. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

E. K. WEDELSTAEDT, D.D.S., St. Paul, Minn., *will demonstrate on large models the methods of the Clubs these gentlemen represent while they operate.*

WM. H. COLGROVE, D.D.S., Johnstown, N. Y. "Gutta-percha Fillings with Cavity Lining."

GEO. V. MILLHOLLAND, D.D.S., Baltimore, Md. "Quick Method of Anterior Restoration with Ascher's Artificial Enamel and Platinum Pins."

I. B. HOWELL, D.D.S., Paducah, Ky. "Ascher's Artificial Enamel."

CLARENCE M. RYAN, D.D.S., Syracuse, N. Y. "Artificial Enamel Filling."

EDWIN J. BLASS, D.D.S., Portage, Wis. "Ascher's Artificial Enamel."

WM. B. FINNEY, D.D.S., Baltimore, Md. "Ascher's Artificial Enamel."

TABLE CLINICS.

Orthodontia.

V. H. JACKSON, M.D., D.D.S., New York City.

R. OTTOLENGUI, M.D.S., New York City.

C. A. HAWLEY, D.D.S., Columbus, Ohio. "The Line of Occlusion in Orthodontia."

Inlays.

DANIEL O. M. LECRON, M.D., D.D.S., St. Louis, Mo. "Gold and Porcelain Inlay."

ROBERT N. LECRON, D.D.S., St. Louis, Mo. "Porcelain Inlays." (The foregoing two clinics given conjointly.)

JOHN QUINCY BYRAM, D.D.S., Indianapolis, Ind. "Porcelain Inlays."

F. T. VAN WOERT, D.D.S., Brooklyn, N. Y. "Cavity Preparations for Porcelain Inlays."

HENRY MCMANUS, D.D.S., Hartford, Conn. "Inlays."

C. EDSON ABBOTT, D.D.S., Franklin, Mass. "Porcelain Inlay."

L. C. ELKINS, St. Augustine, Fla. "Amalgam Inlays and Amalgam Filling in Tin-Lined Cavities."

H. HAYWARD STREET, D.D.S., Baltimore, Md. "Combination Contour Anterior Gold Inlays Faced with Artificial Enamel."

CARROLL H. FRINK, D.D.S., Fernandina, Fla. "A Vacuum Method of Casting Gold Fillings."

T. C. TRIGGER, D.D.S., St. Thomas, Ont. "Gold Inlay."

L. E. CUSTER, A.M., D.D.S., Dayton, Ohio. "Electric Method of Casting a Taggart Inlay."

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J. H. LORENZ, D.D.S., Atlanta, Ga. "Detailed Construction of Gold Inlays and Hard Abutments."

A. M. JACKSON, D.D.S., Macon, Ga. "Short Cuts with Gold Inlays."

Thursday, September 12th.

9.30 A.M.

CHAIR CLINICS.

(Section of the G. V. Black and Wedelstaedt Dental Clubs—Second day.)

WM. FINN, D.D.S., Cedar Rapids, Iowa. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

J. W. S. GALLAGHER, D.D.S., Winona, Minn. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

A. C. SEARL, D.D.S., Owatonna, Minn. "Gold Filling, Mesio-occlusal Surface Superior Bicuspid and Molar."

E. K. WEDELSTAEDT, D.D.S., St. Paul, Minn., *will demonstrate on large models the methods of the Clubs these gentlemen represent while they operate.*

Dental Chair Surgical Cases.

GEO. W. COCHRAN, D.D.S., Erie, Pa. "The Surgical Treatment of Chronic Alveolar Abscess Associated with More or Less Necrosis."

Anesthesia and Miscellaneous Operations.

W. CLAY MIDDAUGH, D.D.S., Easton, Pa. "Illustrating Use of Syringe Attachment in Pressure Anesthesia and in Flushing Fistulous Tracts."

EDWARD A. PERRY, D.D.S., Littleton, N. C. "Chloroform—Stimulating Stage in Dental Operations."

A. J. WRIGHT, Perth, Australia. "Clinic on Anesthetics."

W. H. DEFORD, B.A., M.D., D.D.S., Des Moines, Iowa. "Somnoform—A Clinical Lecture."

J. C. WATKINS, D.D.S., Winston-Salem, N. C. 'Extreme Mandibular Protrusion."

SHIRLEY W. BOWLES, D.D.S., Washington, D. C. "Use of the Greenough Microscope at the Dental Chair."

TABLE CLINICS.

Prosthesis, etc.

FRANK L. HARRIS, D.D.S., Harrisonburg, Va. "Aluminum in Vulcanite."

TRUMAN W. BROPHY, M.D., D.D.S., LL.D., Chicago, Ill. "A Novel Interdental Splint."

MISCELLANEOUS.

WM. CRENSHAW, Atlanta, Ga. 'Changes in the Crenshaw Matrix."

H. L. AMBLER, M.S., M.D., D.D.S. "Cohesive Tin Foil."

GUSTAVUS NORTH, D.D.S., Cedar Rapids, Iowa. "Method of Reading Temperaments."

LEVI C. TAYLOR. "The Junior Phase of the Hygienic Filling."

A. R. MELENDY, D.D.S., Knoxville, Tenn. "Technique of Gold Filling—Cement Lining."

RICHARD BLUM, D.D.S., New York City. "New Envelope for Dental X-ray Films; Examining-Box for X-ray Negatives."

W. F. LAWRENZ, D.D.S., St. Louis, Mo. "Safe and Sound Method of Soldering Inlays, Crowns, Bridges, and Plates."

WM. G. HAMM, D.D.S., Chillicothe, Ohio. "Modern Anesthetics Local and General."

D. H. BALDWIN, D.D.S., Peoria, Ill. "Porcelain Jacket Crowns."

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TRANSACTIONS

OF THE

Jamestown Dental Convention

HELD AT

NORFOLK, VA., September 10, 11, and 12, 1907.

FIRST SESSION—Tuesday Morning.

THE Jamestown Dental Convention was called to order by the chairman of the Organization Committee, Dr. Burton Lee Thorpe, St. Louis, Mo., Tuesday morning, September 10, 1907, at 10 o'clock, in the convention hall of the Jamestown Exposition, Norfolk, Va.

The Rev. Dr. C. L. BANE, pastor of the Memorial M. E. Church, South Norfolk, invoked divine blessings on the deliberations of the convention.

Preliminary to the addresses of welcome, Dr. B. L. THORPE made a few remarks briefly outlining the history of the movement which led to the holding of the Jamestown Dental Convention, as follows:

History of the Movement.

Ladies and gentlemen, members of the Jamestown Dental Convention, and invited guests,—The first steps toward the holding of a dental convention at this time were taken at the instigation of Dr. F. W. Stiff of Richmond, Va., who in the winter of 1904 offered a resolution before the Richmond City Dental Society requesting that the Virginia State Dental Association appoint a committee of three to attend the meeting of the National Dental Association held at Buffalo in 1905, and ask the support and co-operation of that dental body in organizing a dental meeting during the Jamestown Exposition. This resolution was carried, and Dr. Simpson, president of the Virginia State Dental Association, appointed the following committee: Drs. F. W. Stiff, H. W. Campbell, and R. H. Walker. The Executive Council of the N. D. A. favored the plan, and appointed your present speaker to represent the National Dental Association. At the solicitation of this same committee, President W. G. Mason, of the Southern Branch of the National

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Dental Association, appointed Dr. Thomas P. Hinman to represent that body. The Virginia State Dental Association had, prior to this, appointed a committee of three to represent that society, and these several representatives met at Norfolk in February 1905 and proceeded to organize the Jamestown Dental Convention. At the next meeting of the Southern Branch, held in Atlanta in 1906, that association officially recognized the committee of organization, and granted to it financial and moral support, and at its request President Mason appointed Dr. J. E. Chace of Ocala, Fla., and Dr. C. J. Grieves of Baltimore, Md., as additional members of the committee.

The Virginia State Dental Association, with typical southern hospitality, emptied their treasury to finance this convention; the Southern Branch also gave us substantial aid, as did the Maryland State Dental Association, the North Carolina State Dental Association, and Drs. J. Y. Crawford, V. E. Turner, Chas. L. Alexander, E. J. Tucker, and C. A. Bland, who made personal donations to aid in the work of organization. Shortly after the Atlanta meeting the Jamestown Exposition Company appointed this committee of seven as their "official committee of organization, authorizing them to organize, finance, officer, and bring to a successful termination the Jamestown Dental Convention."

The Committee of Organization has labored long, and how well is to be proved in the next three days. If we have made mistakes or errors, I assure you that they are errors of the head, and not of the heart. We have asked the co-operation of the profession in the South, and it has been given in a warm-hearted manner.

With the authority of the Jamestown Exposition Co., which we represent officially, the committee elected the officers of the convention in advance of the meeting, in order that but little time would have to be devoted to preliminary work, and it is our pleasure to present to you the five gentlemen whom we have selected as the officers of the convention, each of whom stands high in his chosen profession. We consider them the five most competent and representative men in the South—therefore their election to these offices of trust and honor.

The officers of the convention—J. Y. Crawford, honorary president; V. E. Turner, president; B. Holly Smith, first vice-president; Geo. F. Keesee, secretary-general, and Mark F. Finley, treasurer—were then introduced to the audience, each making a few remarks in appreciation of the honor bestowed upon him by the Committee of Organization.

Dr. Thorpe then introduced the Hon. Harry St. George Tucker, president of the Jamestown Exposition Company, who welcomed the convention in the following address:

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Address of Welcome on Behalf of the Jamestown Exposition Company.

By Hon. HARRY ST. GEORGE TUCKER,
PRESIDENT OF THE JAMESTOWN EXPOSITION COMPANY.

Mr. President, members of the Jamestown Dental Convention, ladies and gentlemen,—I was never more glad to see a body of men, to say nothing of the ladies, than I am to see you this morning. Last night, for the first time in five years, I suffered the pangs of toothache during the entire night. I can account for it on no other ground than that it was to do honor to the assembling of the Jamestown Dental Convention, and I have come early this morning to offer myself a willing sacrifice by sitting in one of these chairs in order that you may demonstrate the beauty and efficiency of your art to the gazing multitude.

One dentist has always been sufficient to terrify me; six hundred and fifty you may well imagine is sufficient to put me into a state of trepidation. I feel, however, a very peculiar pleasure, gentlemen, in greeting you on this occasion. You have honored this exposition by giving its name to your organization, and we greatly appreciate it. You have gathered here from all over this great land to exhibit and to demonstrate the advances in your great profession. But where could you better have assembled than right here? Three hundred years ago today there was another dentist at Jamestown—the blacksmith's tweezers in the hands of Captain John Smith—and in the succeeding three hundred years certainly no class of professional people have advanced as you have.

You know an exposition is useless unless it demonstrates the advances of the people in some direction. I want you before you adjourn—and I have offered myself as a victim—to demonstrate to the world that a tooth may be extracted and that a nerve may be killed without

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pain. I see these advertisements in the papers, but I am not altogether willing to believe them.

Now, we are glad to see you here for another reason. As you look upon this beautiful exposition and see it in its perfection as it is today, remember, gentlemen, that this has not been accomplished without great labor. You have snags to dig out sometimes; we have had thousands of them, and we had to take them out without the application of an anesthetic—whether chloroform or ether. We have a few left; we want you to help us in your deliberations, to teach us how to pull snags out painlessly.

We are pleased that you are here, gentlemen, because we want to show you one of the most beautiful expositions that has ever been held in this country. We have not been so ambitious as Chicago or St. Louis, but as far as it goes it is as beautiful as any. We have not had money to do all we wished. We have made more progress with small support than any people since God's chosen people thousands of years ago, and the pride that I take, as president of the exposition, is that it is the product, thank God, of old Virginia! Not altogether, however, because the government of the United States has come to our assistance nobly, and twenty-four states of the Union have come forward and built their beautiful mansions along the waterfront in memory of this great event that we are celebrating; but the men who conceived it, worked at it, completed it, are just simply a lot of old Virginia fellows lying around these waters showing to the world that old Virginia never tires, and that there is stuff in her yet when it is needed. [Applause.]

I have come here today to express to you the appreciation of the Exposition Company of the great compliment we feel in that you have come here—on this historic spot—to do the work of your convention. I beg you, on behalf of the Exposition Company, to visit the exposition. And if you have any difficulties let me know about it. We want you to see it, and, above all, remember that while the physical features are great and beautiful, the real purpose of this great exposition is to celebrate the great historic event that made this people great. This exposition is intended to show forth the great progress of the American people in history, in civilization, in government; and just in proportion as the people fail to study these great questions, by just that much will their history in the future be minimized.

Now, gentlemen, I am obliged to you for your time and attention, and must apologize for not being able to remain and hear the addresses of the other speakers. I am glad to see you, to talk to you, but you must remember that you are not the only pebble on the beach—I have three other pebbles this morning. I have to hurry and say "howdy" to three other organizations this morning. May God bless you and prosper you in your work! [Applause.]

Dr. J. W. Eggleston, Richmond, Va., next addressed the convention on behalf of the profession of Virginia, as follows:

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Address of Welcome on Behalf of the Profession of Virginia.

By Dr. JOS. W. EGGLESTON, Richmond, Va.

Mr. President and gentlemen,—I am asked to extend to you a welcome. On no other subject under the sun does there seem to be in literature, ancient and modern, such a dearth, such an entire absence of material to quote or to borrow inspiration from, as on that so feebly expressed by the one word—welcome. Nor is this all. Our very language itself seems to contain no synonym, no other single word to aid hospitality to fitly express itself.

This welcome is to be a Virginian one, and that makes it all the harder to express. Indeed, a Virginia welcome resembles the love of a man for a maid, in that it is so much easier to illustrate and demonstrate than to define or describe.

For three hundred years Virginia hospitality has been a proverb—yes, a part of our very religion. From the days when there was but here and there a home, with long stretches of unbroken wilderness between, and that wilderness often infested with lurking savage foes, from then, until this, our fourth century—you know we Virginians no longer count time from the Christian era, but from John Smith's advent on the James River—from then, I say, until now, the stranger within our gates has ever been to us a holy visitor, to minister to whom is at once a duty and a delight.

This welcome comes to you from the dental profession of Virginia, a body of men who will measure up well to the front with their fellows anywhere. They are high-toned honorable gentlemen, striving in all things for the very highest ideals. It is their earnest wish that each and all of you shall enjoy your visit to our state—that every moment of your stay shall be a joyous, happy one. But how shall I express the idea?

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Most of you remember that old mixed dialogue and song called "The Arkansas Traveler." You remember that when the native discovered his visitor's musical skill his enthusiasm and hospitality burst beyond all bounds, and he said, "Git down, stranger, and come in. Boy, take the stranger's hoss, and put him in the cornhouse and stop the door with a stack of fodder. Come right in, stranger, and set down. Take a cheer, take two cheers. Pull up to the table and pour out your coffee in two cups, sweeten it twice, and stir it with two spoons. Durn the expense." [Laughter.]

That is the way we feel toward you today. And the parallel is complete, too. The Arkansas native's unbounded welcome grew out of the discovery that his visitor could play the fiddle better than he could, and our joy in your presence here with us arises in part from a similar impulse. You are our invited guests, and we would welcome and honor you for that alone, but deep down we have a consciousness that you can play our own tune on our fiddle and play it better than we can. We know that each of you, all coming from well nigh everywhere, brings to us something of your store.

Like the rills from out the valleys of many a mountain side, united here, your wealth of skill and learning forms a vast river of knowledge from whose depths we hope to drink, and drink deeply.

Our chosen specialty of the great healing art has not yet received in the public estimation that recognition we feel it to be entitled to; but it must and will come. Gatherings like this help to uplift the dignity of our calling, and in this fight, now nearly won, Virginia is no laggard, nor will she ever be.

It seems to me that our night of gloom is nearly over. The dawn of hope looms up before us, and while I shall not live to see the sun in the South in its meridian splendor, I can congratulate you younger men that your hopes will yet be realized, and that the world will soon come to recognize that dentists rank with aurists and oculists, as physicians devoting their energies to a medical specialty.

Once more I bid you welcome. Have an old Virginia good time. And when your stay with us is done, and homeward each must wend his way, bear with you none but pleasant memories of us and our fair commonwealth, and may "God be with you 'till we meet again." [Applause.]

Dr. Edward Eggleston, Richmond, Va., was next introduced, and as president of the Virginia State Dental Association addressed the convention as follows:

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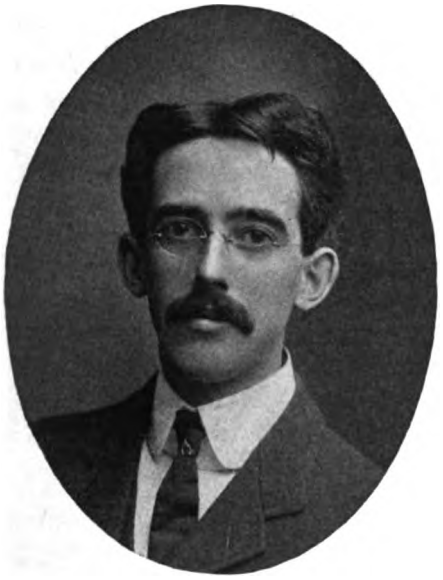
Address of Welcome on Behalf of the Virginia State Dental Association.

By Dr. EDWARD EGGLESTON, Richmond, Va.



Mr. President, ladies and gentlemen of the Jamestown Dental Convention,—As I rise to address this highly intelligent audience I am reminded of a little story which the great humorist Mark Twain tells on himself. On a certain occasion, early in his career, it came to his ears that he was to be introduced to the then president of the United States. He very carefully prepared a pretty little speech, which he intended to deliver at the proper moment, but to his great horror and disgust, when he found himself face to face with a man clothed with such vast dignity and authority, his speech vanished like the fading of a rainbow at sunset and he was only able to say "Good morning, Mr. President. I feel very much embarrassed, sir; how do you feel?" [Laughter.]

I expected to deliver a very pleasing speech this morning. No doubt that remark indicates some little egotism on my part. Perhaps, however, when I reveal to you my secret, you will be relieved of this impression. The secret is that I shall have very few words to say.

As evidence that we Virginians are delighted to have you here among us, and are determined that you shall have a good time, and a profitable one, I wish to point out the fact that those in authority have found it necessary to delegate two of us to deliver their fraternal greetings. The burden was so great that one could not bear it, therefore my father and myself have both been appointed to give you welcome and to make sure that you feel that you are our guests in reality throughout the brief period of your stay. I do not speak to you for myself alone, but I have a message to deliver from the Virginia State Dental Association. We want you to know how great is the interest which we have taken and

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still take in the success of this convention. Unfortunately, or fortunately as the case may be, your chairman has partly made my speech for me, in that he has told you many of the things we have done to promote the interests of this convention. However, since I have these facts in mind a little differently, I shall review them in your hearing, and then I will have done.

As your chairman said, this movement started in the Richmond City Dental Society. From there it went before the Virginia State Association meeting held at Lynchburg during August 1905, where the whole matter was thoroughly discussed, and the association indorsed the movement, and appointed the gentlemen mentioned by the chairman as a committee to look into the advisability of holding a great international dental convention at this time and place. Then a year ago, when we convened just across the waters here at the grand old Chamberlain Hotel, these gentlemen came before us reporting progress and asking if we could help them financially. In response to that appeal we promptly emptied our treasury, and gave to this convention four hundred dollars in cash to aid in the preliminary preparations for this gathering. Not satisfied with that, we appointed a special reception committee to look after your every want and comfort, and make you feel at home. Incidentally, it was understood that every member of our association belonged to that committee. The association has taken such an interest in this work that an exceedingly large percentage of our members have become members of the convention, and are working heroically to make the meeting a success.

It gives me great delight to inform you that the Virginia State Association has planned to tender to this convention an entertainment. I have appointed a special committee to see to the success of this feature, and mention it here that you may all plan to be with us on that occasion. I cannot tell you at the present moment its exact nature; that will be made known to you later. I now extend to you the warmest possible greetings and welcome from the Virginia State Dental Association. [Applause.]

Dr. W. G. Mason, Tampa, Fla., the president of the Southern Branch of the National Dental Association, then addressed the convention, as follows:

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Address of Welcome on Behalf of the Southern Branch of the National Dental Association.

By Dr. W. G. MASON, Tampa, Fla.

Mr. Chairman, gentlemen of the convention,—It is eminently fitting that we should gather in convention at this time and place; that we, too, should unite with the nation in commemorating the anniversary of the founding of the first permanent English settlement—the acorn from which has grown and developed this mighty republic, that stands today the greatest of all nations past or present. It is a pleasant coincidence that we should meet in close proximity to the birthplace of dentistry, the city of Baltimore, where in 1839 was founded the first college to teach the principles of dental science—a science that ranks today among the foremost in blessing mankind.

The Southern Branch of the National Dental Association yielded its meeting this year to this convention, thus contributing in no small measure to the possibilities of this meeting, and we are pleased in being instrumental in calling together such a union of dentists from all sections of the country. And as president of the Southern Branch, in its behalf I extend a most cordial welcome both to each individual present and to the various organizations represented here—to those from the northern, eastern, and western sections of our country. We extend to you a special welcome to the South and wish for you every pleasure and comfort, so much so that you may come again, that we may form bonds of unity, of interest, and sympathy, thus making possible greater achievements in our field of endeavor.

Let us hope that the greatest harmony will pervade this meeting and much and lasting benefit flow from it; that the object of our conventions—mutual growth and individual development—may be the keynote of all our considerations. These are occasions that offer great opportun-

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ities for the practitioner in the way of ascertaining what progress and advancement is being made in both theory and practice; also to hear the leaders of thought discourse upon subjects of great importance to the profession.

As we take an historical view of this country from the founding of the colony which we now commemorate, we are amazed at its growth and development thus seen by comparison. So in the dental profession, as we take a retrospective view of dentistry, we are no less impressed with the great strides the profession has made during the compass of the last half century. And especially during the past decade has it demonstrated the possibilities of achievement that should justify the dentist in feeling a peculiar pride in his profession. In dentistry, as in every other endeavor of life, past accomplishments are but evidences of future possibilities, and considering its record, we have a most brilliant future awaiting our efforts to attain scientific excellence.

We have listened to words of welcome so kindly spoken, and in behalf of our organization I assure the speakers of our sincere appreciation. [Applause.]

Dr. J. Y. Crawford, Nashville, Tenn., was next introduced, and addressed the convention on behalf of the profession in the South. (See opposite page.)

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Address of Welcome on Behalf of the Profession in the South.

By Dr. J. Y. CRAWFORD, Nashville, Tenn.

Mr. Chairman, ladies and gentlemen, —All through my life I have had laid out for me what seemed to be greater undertakings that I could accomplish, and when the committee notified me that I was to be its honorary president, and a little later on, that I was to come to Virginia and stand upon this consecrated spot and look back more than three hundred years and call attention to the most remarkable event, the farthest-reaching event that has ever occurred in the western hemisphere, I felt delighted at the honor, but overcome at the task set for me. I stand today in your presence feeling less competent to perform this duty than any one present. Why? Because when I stand on this spot —this consecrated spot—where over three hundred years ago a handful of people landed to inhabit this great land, I am overwhelmed at the importance of that event. A few years following that event, another type set their feet upon Plymouth Rock. These two types of people have mingled together through these lands—the Cavalier and the Puritan—and from them has sprung the present American citizen—the leading type of mankind on the face of this earth. To be called upon by your committee to extend a welcome on behalf of the great southern states—Georgia; Alabama; Mississippi; the Lone Star State; beautiful Louisiana; Florida, where the orange blossoms send out their sweet fragrance and where the sun shines more beautiful than any other part of the world; Tennessee, the volunteer state; Kentucky; Missouri, which was made celebrated in this country by the wonderful Missouri compromise that held in check the surging influences that finally resulted in drenching this great country with blood; the Carolinas; Virginia, the state which has furnished more genuine patriotic enthusiasm than any other state in the Union—Virginia, that produced the man who stood on this consecrated ground and declared in public, "Give me liberty, or give me death!" the state which made George Washington; the state which has done more to put the sentiment of Patrick Henry in the human heart than any other state—I say, for me to come before you to welcome you on behalf of these great states makes me feel my utter weakness.

When I look away to the great Northeast and send this message to the great empire state, New York, which has made one president by accident; when I look to the great Northwest, and send the message to enjoy the hospitality of this land,

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and select from the midst of this great Northwest the state which in all probability will furnish our next president—and I hope to God it will!—Nebraska [applause]—I send this welcome to them, and to the people across the water and to those who have honored us in coming from foreign lands. We extend to you a cordial southern welcome, and what more could we say? It means a welcome from the people who have always said to the stranger "The latchstring is on the outside." Whether it be on the worn and unsteady door, swinging to and fro, or whether it be a beautiful gold and silver knocker on the door of a beautiful home, the cordiality of the southern welcome is just the same. The southern welcome, gentlemen, is the best welcome, I believe, in the world. We extend it to you today, and if, Mr. Chairman—if this convention does nothing else, I hope that by coming here and placing our feet upon this consecrated ground, made so by the lives and by the blood and by the suffering of those who have preceded us, I hope that if nothing else is accomplished, it will send out from this great Southland an appeal which shall result in a proper patriotic appreciation of the things that pertain to the welfare of mankind. Love of man is next to love of family. First let a man love his family, love his fellow-man, love his God, and he will have all the elements in him necessary to make success in life, provided the opportunities present. These are some of the sentiments, ladies and gentlemen, that influence me to assume to address you on this occasion. And I hope the inefficiency of my words, the inadequacy of my mind to paint this picture, will not detract from my earnestness and my desire to extend to you this cordial welcome on this occasion.

It is fitting for the dental surgeons of this country to come here as the result of that event that occurred in this consecrated locality more than three hundred years ago. I would be glad to tell the American people, the people of the civilized world, that one of the greatest accomplishments of these people as the result of that event has been the development of the profession of dental surgery in the United States. I trust you will appreciate the importance of this, when I say that it was in this section of the country that first a body of men went before a legislature and asked for a charter for a dental college—that it was here, in a southern state, the state of Maryland.

Ladies and gentlemen, we extend you again our most hearty welcome, and remember that the latchstring is on the outside. [Applause.]

The next speaker was Dr. J. D. PATTERSON of Kansa[illegible] Mo., who respond[illegible] the ac[illegible] f welcome, as follo[illegible]

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Reply to the Addresses of Welcome.

By Dr. J. D. PATTERSON, Kansas City, Mo.

Mr. Chairman, ladies and gentlemen, —I desire first to return my thanks to the officers of the convention for the courtesy and honor of an invitation to speak at this time. To those who have given us welcome I will say,

> We do receive your offered love like love,
> And will not wrong it.

A response signifies a return for courtesy of the acts and words of others. As I look into the faces of those before me who are your visitors, I perceive from the gleam of pride and interest aroused by your welcome that each one appropriates the invitation and welcome as being for himself alone—a personal one.

We feel our hearts warm to the South; to Virginia; to the Jamestown Exposition; to the organizers of the dental congress; to every association assisting, and to every individual who has brought his mite and his presence.

Little they thought who first made their settlement on this shore that one day—our day—would see a congress of dentists here! but in the enrollment of the world's beneficences, dental surgery, by inherent right, occupies a prominent position as one of the professions which minister to the comfort and advancement of the individual and of the world. We are proud to be here at the opening exercises of the present great convocation.

Your visitors have been charmed with the spontaneity of your greeting, and we pledge ourselves to equal you in fostering all that conduces to the betterment of dentistry, but we cannot expect to equal the forensic eloquence which your welcoming has displayed.

Futile indeed would it be to visit Virginia and compete in oratory, when we know that from its valley—the "garden spot of the world"—to the highest top of White Top, the state is thickly studded with eloquent men known the world over. Nor can we forget that the Virginia commoner who thundered "America for

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Americans!" was born over in Hanover county and was named Henry Clay!

Patrick Henry, your first governor, by his argument and persuasive oratory prevented the enforcement of the iniquitous stamp act passed by the British Parliament, and received the high encomiums even of his enemies in that parliament upon his unexcelled eloquence. Public speaking and eloquent imagery is a heritage of Virginia, and we only come to worship, not to equal it.

But we can tell you that we are proud of your profession and proud to be with you. We are here because we have that pride. We have traveled thousands of miles to give you "Hail!" and to join with you in again giving voice to the faith and belief that we, as ministers to the perfection of speech, and face, and form, are building better than we have hitherto, because all beauty of the human form divine, as well as its power of mind or muscle, must ever be most intimately dependent upon our intelligent practice and direction. No permanent good can come to nations or individuals in the absence of good physical conditions. And these sound physical conditions, the result of perfect nutrition, are so interdependent with competent dental organs that our calling enters the list among the very greatest—the greatest in all the beauty of life; in its poetry; in its citizenship; in its love.

I can scarcely continue until I notice that we, your visitors, deplore with you the passing from among us of those whom we hoped again to greet, among them the greatest guest of honor and the star upon your program—Willoughby D. Miller. It brings to the speaker memory of a precious day spent with him at his then home in Berlin, when he with courtesy and helpfulness neglected his manifold duties to show us investigations and experiments then under way in his laboratory.

He wore a manly face,
And struggled in the world's rough race
And won at last a lofty place.

Those who have passed from life's activities are still with us. "They beckon us, knowing that there is no retreating, and so we know that there is no dead left behind; that in the measure that we have loved them, and they have loved us, they are with us still, strengthening our hearts in dreams and in secret musings. They have taught us to accomplish work that will survive unchanged and beautiful when time shall have withered the garland of youth, when thrones of power and monuments of art shall have crumbled into ashes." Today there comes to my mind and to yours a yearning to greet many of the fathers in dentistry. In Virginia there were men of proud stature, and noble men crowned with whitened locks, whose welcome is not audible today, but the echo of their oldtime greetings I am sure is in your hearts as it is in mine. In the unseen procession you will see many forms. There especially appears to me the courteous W. H. H. Thackston of Farmville and the unassuming J. Hall Moore of Richmond.

They sleep beneath the shadow of the clouds
Careless alike of sunshine or of storm,
Each in the windowless palace of rest.

It is surely good to consider upon these occasions what makes for the most good as individuals and as a profession; to consider that there is a moral order of the world, and that there is a progress; that truth, justice, wisdom, and moderation are sure to triumph.

If our deliberations make for this good, then will your welcome and our

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response bear rich fruition, and the memory and instruction given by the consideration of the unfolding of time since the first settlement by the London Town Companies at Jamestown three hundred years ago will send us back to our homes with better purposes and higher ideals, with a determination to do something—to accomplish.

Our President said the other day: "The true doctrine to preach to this nation, as to individuals composing this nation, is not of the life of ease but the life of effort." And we might add that the effort must achieve that which will live when these, our mutable and perishing voices, are hushed forever.

Your words to us, our words to you, people life with new and lovelier genii, make the day brighter, make us see new beauty in the moon's pale gleam, give lovelier hue to the flower, more delicate tracings to the foliage, new delight to the singers of song—bring fresh to mind that "the better part of one's life consists in his friendships"—in short, spell LOVE.

Dr. Thorpe then introduced the president, Dr. V. E. TURNER, Raleigh, N. C., who read the "Address of the President." (See opposite page.)

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Address of the President.

By Dr. V. E. TURNER, Raleigh, N. C.

THE Jamestown Dental Convention is unique. Its organization is an outcome of the patriotic thought of a few noble-minded men who, holding ever dear the advancement of their profession, have brought to a successful issue their plans for this assemblage.

When it was known that the state of Virginia and the United States Government would undertake an exposition to commemorate so important an historic event as the founding of the Jamestown Colony, several earnest citizens of this commonwealth conceived the idea of connecting with it a meeting of dentists.

They believed that this meeting would contribute to the interests of the occasion an exhibition of the present status of a science which has seen its greatest development in America; they thought that it was not ill-timed for us as a profession to participate in the general educational features of the exposition, and finally they felt that no assemblage of dentists could occur without material advancement in all that makes dental service useful or adds to the dignity of its votaries. A few ardent spirits from other states became interested in the movement, and a little more than two years ago, in Buffalo, the Committee of Organization was formed.

Many have seemed to think it inexpedient to attempt another international gathering so soon after the congress at St. Louis, but in spite of this adverse opinion and the apathy found on many sides, and at great personal sacrifice, the members of this committee have labored unremittingly at their task. They have been determined that this great event of a great nation should not pass without a creditable dental assemblage. The success of their efforts is evidenced in the membership roll and the published program of this convention. But the objects which they had in view require little explanation to those who have been leaders in the advanced thought and the professional activities that are responsible for the real progress in dental surgery.

We know that permanent advance in any science is incomplete, and to a certain extent ineffectual, without a record of the means and the men who have been the factors in that advancement. As no country can progress in all that makes a nation great without keeping in mind the previously existing conditions and the means employed to improve these conditions, so it is necessary for a scientific calling like dentistry to record and preserve the various steps in its upbuilding. In this way the scientific gathering furnishes the opportunity for putting on record and preserving the new facts

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which have been ascertained, and all the verified steps which have been taken in the labor upon the yet unsolved problems of dental science.

The dental convention is the maker and recorder of dental history, and it does not seem ill-timed or unfitting that a meeting of dentists should be held in Virginia during the Jamestown celebration. What more suitable soil for a gathering of the votaries of a science which has practically seen its birth as a profession in America, than that of the mother of presidents—the birthplace of Jefferson, the founder of American liberty—and the home of the immortal Lee. This is the very cradle of the Republic itself, and as we stand here today, we should remember that we are on some of the historic ground of our own profession. Not far distant, on the shores of these very waters, lies the city wherein now lives and flourishes the first organized effort at dental education in the history of the world.

In that same city was published the first periodical devoted entirely to our calling, and the first text-book for the instruction of our dental youth was written by one of her distinguished citizens. A little farther south, in Alabama, was the first enactment to authorize the appointment of dental examiners to test the competence of persons who wished to enter the practice of dentistry.

Thus it will be seen that this section of our great country has been intimately identified with the beginnings of our professional life-history. As it is not my purpose to immodestly exploit the part taken by this section in dental achievements, it is but just, and my pleasure, to add that since that time each state of this great country has contributed its quota to the advancement in dental surgery.

With hardly more than a dozen practitioners a century ago, we have now in this country over forty-five thousand, and can you find in all of our eighty millions of people a better and more patriotic class of citizens, or men who love their country more, or who would guard more zealously her liberties?

Those men who spend their lives in the effort to ameliorate human suffering are ever on the alert for enlightenment and truth, and to such what can be more attractive than this historical and educational exposition, celebrating the birth of this, the greatest of all nations? The birth of the Republic of liberty and the achievements of American dentistry are being commemorated here today. Let us see to it that the honor of both shall be kept inviolate, and as we would guard our liberties from tyrants, so let us forever guard our science from the taint of commercialism.

DR. MILLER'S DEATH.

The absence of one face here today is a source of much sadness to us all. He was one who was expected to take a prominent part in the activities of this meeting. Doubtless you all know that I refer to the late Dr. Miller of Berlin, whose sudden and untimely removal has been a terrible blow to his friends and the whole profession. His whole life has been devoted to study and research, and the results have been a great boon to the profession as well as to the whole human race, and his brilliant achievements should be appropriately commemorated in our printed proceedings. He has erected lasting monuments in our hearts,

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let us now place to his memory an appropriate memorial, which will tell future generations what he has done for his kind and will show our admiration for his noble life.

Dr. THORPE moved that the President's address, and his recommendation that a fitting memorial to Professor Miller be prepared, be referred to a committee of three, to be appointed by the chair; the committee to report to the convention at a later session.

Motion carried.

Dr. CRAWFORD, chairman, appointed the following as such committee: Drs. B. L. Thorpe, James McManus, and A. R. Melendy.

Dr. THORPE moved that the following foreign members of the convention be made honorary vice-presidents: Drs. N. Etchepareborda, Buenos Aires, A. R.; Karol Jakobowski, Lemberg, Austria; A. J. Wright, Perth, Australia; Ernesto Paz, Mexico City, Mexico, and Robert N. LeCron, London, Eng.

Motion carried.

Dr. ETCHEPAREBORDA, who came as a delegate to the convention from the l'École Dentaire, Paris, France, was introduced to the audience and addressed them in French.

The delegate to the convention from La Sociedad Médica "Pedro Escobedo," of Mexico, Dr. ERNESTO PAZ, presented the following credentials:

MÉXICO, Agosto 20 de 1907.

Al Socio Titular DOCTOR ERNESTO PAZ, *presente*—

La Sociedad Médica "Pedro Escobedo," en la sesión ordinaria, verificada el viernes 16 del mes en curso, accordó nombrar á Usted su delegado para representarla en el Congreso Dental que tendrá verificativo en Jamestown del día 4 del próximo mes de Setiembre en adelante.

Lo que por acuerdo de la Sociedad tengo la honra de comunicar á Usted protestandole las seguridades de mi atenta y distinguida consideración.

MIGUEL J. NIETO,
El Secretario.

Drs. LECRON and JAKOBOWSKI were then presented to the convention.

Dr. WRIGHT of Australia was next presented, and spoke as follows:

Mr. President, ladies and gentlemen,—I can assure you that it is a great surprise to me to receive the high honor which you have conferred upon me this morning. It is also a great surprise to me to be called upon to make a few remarks. I may say that we in Australia look upon America as the mother of dentistry, and we are always glad to visit you, and take back with us some new thought that may be beneficial to our profession in Australia. I am sorry to say that the general public in Australia is not educated to the importance of dentistry as it is in America. It is rather regrettable that the public in general look upon dentists as a necessary evil, but from what I can understand the majority of the public in America visit the dentist once or twice a year that they may have their teeth properly attended to. We in Australia are called upon to perform a greater number of extractions than you are in America. I have been much surprised to learn from graduates of your schools—who I would like to say do you credit—returning to Australia that during the time they have been students in the colleges or universities they have not extracted a dozen teeth. One went so far as to tell me that he had not extracted more than three teeth in the three years he had spent in a school in this country. But I want to

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tell you, gentlemen, that we are often compelled, on some days, owing to the deplorable condition of the teeth, to extract from fifty to one hundred teeth. It is difficult for us to get people to understand that fillings will preserve the teeth, and they allow them to decay to such an extent as to render it almost impossible to do anything for them when we see them. But I am glad to say that during the last few years the conditions have been slightly altered, and I believe that within the next ten or fifteen years Australia will be second to none in the preservation of the teeth.

I wish to thank you, gentlemen, for the very cordial welcome that you have extended to me, and for the honor which you have conferred upon me. [Applause.]

Dr. H. W. CAMPBELL, secretary of the Organization Committee, presented the rules and regulations for the government of the convention as the report of the Organization Committee, for approval.

Dr. CRAWFORD moved that the report of the committee be adopted and that the rules and regulations suggested be concurred in.

Motion carried.

Motion was made and carried that the convention adjourn until 2.30 P.M., and at that time the members meet in the hall for clinics, as arranged for by the committee and described in the program.

Adjournment.

A "Smoker."

At 8.30 P.M. a "smoker" was held, presided over by Dr. B. Holly Smith, which was attended by the members of the convention, accompanied by a large number of ladies.

SECOND SESSION—Wednesday Morning.

THE meeting was called to order by the president, Dr. V. E. Turner, at 9.30 A.M. Wednesday morning, and Dr. B. Holly Smith, first vice-president, was asked to preside.

Dr. H. W. CAMPBELL, secretary of the Committee of Organization, presented an invitation from the National Association for the Study and Prevention of Tuberculosis, to the members of the convention to visit the exhibit of the Tuberculosis Congress in one of the exposition buildings.

The first order of business for the morning session was the reading of a paper by Dr. F. T. VAN WOERT, Brooklyn, N. Y., on "Is the Cemented Filling the Filling of the Future?" as follows:

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Is the Cemented Filling the Filling of the Future?

By F. T. VAN WOERT, M.D.S., Brooklyn, N. Y.

I APPRECIATE the honor of having been selected as one of the essayists of this meeting, and hope the matter I present will prove of interest and value, also that it may bring out a discussion which will establish a conversion to what I believe to be the coming practice for the restoration and salvation of teeth.

I realize the many difficulties to be encountered, the most important of which is the prejudice on the part of the profession against abandoning what has been the keystone to the arch of our science—gold foil. Personally, I believe that gold foil has seen or is now seeing its last days, and that we are at the dawn of a new era.

In looking back over a personal experience of over thirty years, it seems strange to find that nearly all efforts have been made in the direction of perfecting a method, and not of changing things by the adoption of a new one, and that now, when one which is practical is presented, it does not meet with unanimous indorsement by becoming the general rather than the exceptional practice. This may seem a broad statement, but it will take very little investigation to convince you that it is true.

RELATIVE TOOTH-SAVING PROPERTIES OF FILLING MATERIALS.

In my college connections I found that the majority of students, from the first day of their freshman year to the final one of their senior, seemed to have but one goal, namely, perfection in gold manipulation. Their masterpieces at graduation have been the restoration of contour with gold foil. An amalgam filling would receive only passing praise, while one of gold seemed to be a thing of beauty and a joy forever.

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For a gold filling, whether it be of cohesive or non-cohesive foil, a tooth must be so prepared that it will support and protect the filling for its own salvation—which effect in many cases is but for a limited time, even when from the hands of the most expert. I remember standing beside the late Dr. Marshall H. Webb for several hours to watch the insertion of two large contour fillings in the upper central incisors of our dear old friend now gone, Dr. Orville E. Hill. When they were completed, I breathed a prayer that some day I might be able to accomplish a like result—for I assure you they were a work of art. But, sad to say, they lasted less than one year. To be sure that is an extreme case, but at the same time I believe the percentage of failures with gold foil to be greater than that with any other material at our command. In any event, satisfactory results in the use of gold foil are obtained only at the hands of those operators who are its masters, and unfortunately there are not as many of these as there should be, if its use is to be continued.

Amalgam has been the greatest friend the dental profession has ever known, the greatest godsend to the public, and, I am sorry to say, the most abused of any substance given us with which to preserve human teeth. With it one does not have to more than half try in order to get a result that will last at least long enough to free one from censure for lack of skill. When properly inserted there is no question about the ability of amalgam to save and make comfortable any tooth, and while the chief objection to its use is its appearance, yet this has become true of gold. The use of amalgam will probably last for many years, if not for all time, and its employment cannot be superseded entirely by the cemented filling—at the present status, at least.

Gutta-percha will in all probability hold its own as a temporary stopping, or for use in very small cavities which are protected. Such has been its particular value for many years.

Cement will become the standard when protected by a covering of porcelain or gold.

I cannot believe that any of the base metals will be used to any extent, as there could be no object other than the cost of material to recommend them, and this is so small a matter that it is hardly worth consideration. On the other hand, there are many serious objections to their use.

THE CEMENTED FILLING—PORCELAIN.

My conversion to the cemented filling can only be explained, and I hope sustained, by a detailed account of the methods necessary to produce results which would warrant such a conviction.

The following figures will show in what proportion this matter has grown upon me: In 1904 there were 317 cemented fillings inserted for my patients; in 1905, 391; in 1906, 498; and to July 1st of the present year, 430, against less than one dozen gold foil operations for the first six months of the present year.

When Dr. Jenkins first gave up the use of other materials for that of porcelain exclusively I feared the result; but now, in addition to my appreciation I feel under deep obligation to him for his courage in setting us an example.

Personally, I do not follow his teachings in full, but I do use his porcelain almost exclusively for filling operations —not for crown work, for the latter a

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high-fusing body being my preference, because a rigid and permanent matrix that prevents warping under such a high temperature is used. I am sure that, when properly fused, Jenkins' or Brewster's gold matrix body is of ample strength for any filling where porcelain is indicated. The success of a porcelain filling is dependent more upon a correct occlusion and the care exercised in fusing, than upon any other factors in its construction.

That porcelain is not more universally used is due to several causes, the first and foremost being the difficulty in securing a matrix of such correct adaptation to the cavity as to serve the purpose which it is intended to fulfil. Second, the absence of a method by which the lines of contour may be followed with a fair degree of accuracy. Third, difficulty as to color. Fourth, liability to repeated failure, due to the fusing and occlusion, as stated above. All these difficulties, I hope to show, can be overcome.

The old fear of these fillings falling out because of the disintegration of the cement has been, I think, a mistake, and on that point the following remarks by Dr. I. N. Broomell at the February meeting of the New York Odontological Society (*Cosmos,* June 1907, p. 616), present the most concise and logical explanation that could be offered. He says:

"If lactic or other acid solutions are the chief agents concerned in bringing about the destruction of the cement, they can only do so as acids, which they will cease to be when they are neutralized through the chemical changes which are bound to take place within the confines of the sulcate-like joint through inactivity of its contents. My belief is, therefore, that a cemented filling never fails through a dissolution of the cement."

There is much evidence that cemented fillings have stood the test of many years, and the number of years during which crown and bridge work has held sway goes far to prove this. That teeth poorly crowned under adverse circumstances will last for many years with comparative comfort is another evidence in favor. I have seen cemented fillings that were ground to shape last from ten to twenty years, and have had the pleasure within the last three months of examining one of porcelain which I myself inserted over fourteen years ago, and found it just as good as when first placed in the tooth. I remember several cases reported at our local meetings where gold fillings had been displaced in finishing and were cemented at the same sitting, lasting for several years. Thus we see that the dawn of this new era is due rather to methods which make the cemented filling practical, than to a new theory.

DR. TAGGART'S GOLD INLAY SYSTEM.

The introduction last January of Dr. Taggart's gold inlay, and the instrument for producing it, removes the last barrier to the fortifications of that vast army of gold foil knights, and they must surrender and take up arms in defence of the new king to whom they will swear allegiance; and if under him they are as courageous and zealous as under the old, we may hope to draw near and possibly surmount or destroy the last wall which conceals from the world the ideal filling.

The procedure which has given me results that are responsible for my present

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position is inferior, theoretically, to that advocated by Dr. Jenkins and a number of others, and it required a practical demonstration to convince me of that fact. And it is that experience which has eliminated charts, drawings, or lantern slides from this paper. In the past I have listened to elaborately illustrated articles on this subject, but without conviction that the impression method for porcelain fillings was the best; yet it took less than half an hour with our good friend Dr. Taggart to prove to me that it was so; hence my practical demonstration which is to follow, at the pleasure of your committee.

CAVITY PREPARATION.

Either method requires a properly prepared cavity. This would naturally include the formation of the same, but I prefer to separate these subjects, because there are a number of theories advanced by prominent writers relative to cavity formation any of which it would be safe to adopt, as they are all based on the principle that a cemented filling should be so formed as to be self-supporting; in other words, the cavity should be so shaped that when the opposing teeth are brought in contact with the filling they will force it against the cavity seat without any rocking or actual misplacement.

Under the head of cavity preparation I mean the removal of all carious matter and of such other pathological conditions as would interfere with cavity formation. To some this may seem a ridiculous distinction, but when no less a personage than the distinguished Dr. Jenkins forms his cavities first, and after making the matrix finishes by removing the carious tissue, I think I am justified in making it. There is no question of Dr. Jenkins' ability to obtain the best results in this way. Few have the keen perception and sound judgment to support them that he has. My deductions are based on the capabilities of the general or average practitioner, and it is to the latter that I hope this paper will prove of value, and help him over some of the high bumps, so to speak.

The only objection to the removal of all carious matter before burnishing the matrix or taking an impression is that it generally results in undercuts which interfere with its draft. This is very easily overcome by temporarily filling such places with Gilbert's or some other temporary stopping. A thin coat of vaselin eliminates any possible adhesion or other source of interference in operations such as the following: Take for example two cavities, one being anterior approximal of the first molar, either upper or lower, and the other posterior approximal of the second molar—a very difficult location in which to secure a proper matrix, and particularly by the burnishing method, which would require extensive separation, and if the cervix were below the gum line a compress should be worn for two or three days, to obtain the best results. The impression method eliminates practically all of this. A thin wedge worn overnight will give ample space, as only enough space is required to permit of clearance for a piece of 32-gage metal, and for this I use platinoid, which has many advantages over others, as I will show and explain better in my clinic. A strip is cut about one-quarter wider than the tooth, the corners being rounded to prevent cutting or scratching. It is then bent at right angles at a point to allow sufficient to pass just below the cavity

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margin for the posterior approximal cavity; for the anterior the long part is bent up and back parallel at a point which leaves enough to cover the crown of the tooth.

THE IMPRESSION.

A sufficient amount of Detroit modeling compound is now prepared. I specify this make of compound because it is the best that I have been able to find for the purpose, and when in thin cakes, as they have furnished it for me lately, by slightly warming in water it is easily cut with an ordinary table knife into narrow strips, which puts it in the most convenient form for ready use. The metal tray should be warmed sufficiently in a Bunsen or alcohol flame to make it adhere perfectly to the compound, which should now be shaped so that it will pass into the cavity, and then cooled, when it is ready for final warming to take the impression. It is this procedure which is most important in obtaining a satisfactory result. If the compound be heated so that it is all one temperature the impression will be nothing like the cavity, but if that surface which comes in contact with the tooth be soft enough to stick to it, and that which is next to the tray be hard, it has enough resistance to force the soft portion to a perfect adaptation of all the parts, and minimizes the time required for its setting or cooling. When it is removed a perfect counterpart of the cavity should be the result; if not, another impression—or, in fact, several—can be taken in a few minutes, in less time than a matrix could be made in the mouth. The same procedure is applicable to cavities in any location, with the exception that the metal tray or cup must be formed in accordance with the requirements of the location. These conditions can only be explained by a demonstration.

THE AMALGAM DIE.

After securing a satisfactory impression the surplus metal should be cut away, leaving only that which is in direct contact with it; then a suitable quantity of plaster is mixed, of a consistence to stand when placed in the form of a cone on a glass or other suitable slab. The impression, metal side down, should be forced deeply enough into the plaster to leave a strong wall around it. After it is hard, trim the top to leave a depth sufficient for the amalgam which is to form the die; here is where many fail, and their failure is usually due to an effort to fill the impression as one would a cavity in a tooth—that is, by getting rid of the excess of mercury and burnishing with considerable pressure. This the compound will not stand, but it will stand a good even pressure over its entire surface, and if the amalgam be worked into place very soft, enough of the excess mercury can be removed by pressure upon the whole mass when the impression is completely filled; the result will be a very sharp, clear reproduction of the tooth-cavity.

ADVANTAGES OF THE METHOD.

The porcelain filling made from such a die—if it fit the die—will surprise many, and what will be more surprising is the fact that in many cases it does not fit, and that very often in a location that would escape your notice in the tooth.

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In the days when porcelain fillings were confined to surfaces where all margins were exposed it was very easy to detect these defects, but when they are placed in obscure positions it is sometimes impossible to find some of the minute imperfections that are bound to occur; even if it were, what is the remedy? A long, tedious, and nerve-racking operation to secure a new matrix, which in turn is liable to be defective, if not made so in the fusing; while with the impression method it is a simple matter to make a new filling, or several, before the return of the patient.

Another great advantage is where there is difficulty with colors in the restoration of centrals or laterals. I have often been obliged to combine two or three colors and make several fillings for a satisfactory result, all of which is done without the knowledge of the patient, and, more important than all, without the nervous strain necessary were each filling made in a matrix obtained direct from the tooth.

Still another and extremely important consideration: What provision has been made or can be made toward securing a proper occlusion by the burnishing method? Personally, I know of none. On the other hand, where an amalgam die is used, a mush-bite is secured, the die placed in position and articulated as for a crown, bridge, or other operation of the kind. The matrix is filled and the porcelain is fused to an approximation of the shape, leaving the margins exposed so that they may be readjusted to the die after it is placed in it. Then the balance of the body should be spatulated to the proper form, but in excess, and after drying it is carved to suitable articulation and given the final fusing.

THE FUSING.

As stated before in this paper, the last two operations are the most important factors in the construction of porcelain fillings, and I have found that all bodies, whether high- or low-fusing, should be fused at as low a temperature as possible to obtain the most strength. I have heard it stated that the S. S. White 2300° porcelain will fuse on pure gold if given time enough. This I do not know, but I know that Jenkins' or Brewster's gold matrix bodies can be fused in less than one-half minute, but the result is a porous, brittle mass of no value, while the same material fused at a temperature that would require three or four minutes gives a very dense result which takes a polish after grinding that would make it hard to detect that it had ever been placed on the wheel. In porcelain fillings three or more fusings are required, and if the first be brought to a perfect fuse, by the time the last one is finished the first has been ruined. Should this be a filling having to sustain much stress, the entire filling is ruined. To overcome this, the first layer should be placed in the center of the lowest point in the matrix and fused to a very dull biscuit, at which point the greater part of the shrinkage has taken place. The second should be the same—except, of course, that each layer should be brought nearer the margin and contour—and the final one fused to a smooth but not glassy surface. Such a filling will possess all the strength that is possible to obtain from the body used.

THE SELECTION OF COLORS.

In the exposed surfaces this is a very important matter, yet one that I think

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is easily managed. First it must be remembered that the cement when placed under a porcelain filling brings to light all the color there is in it, and makes it appear darker than the one selected. It is necessary to make provision for this, and I know of no better way than to select a color as near that of the tooth as possible, and then add enough plain white to make it about two shades lighter than that required. I know of no fixed rule by which this can be done, so it is largely a matter of experiment and experience with each operator, very much the same as in the combination of several colors.

CEMENTS.

Several cements are on the market that are eminently satisfactory for the setting, and but one precaution should be observed in selecting from them—that is, to adopt one color, and preferably cream white; any attempt to better the shade of the porcelain with cement usually results in failure. The exception to this rule is in cases where the enamel is thin enough for the cement to show through in the anterior teeth; in such cases the colored cements are invaluable, but should be used in connection with the white.

My best results in cementing porcelain fillings have been obtained by the following method:

First etch the surface to which the cement is to adhere, then cut with a knife-edge disk irregular grooves around the bulbous portion of the filling, boil in a strong solution of sodium bicarbonate, and rinse in 95 per cent. alcohol. The soda is to prevent continued action of the acid, and the alcohol to free it from any fatty matter that may be acquired in the handling. That the action of hydrofluoric acid is continued for several hours unless this precaution be taken is easily proved by a thorough washing of the case after etching with brush and water, and setting it aside for a day, or overnight. The result is a thick coating of a chalk-like substance covering the entire surface where the acid has been applied; this is easily removed with a small brush. Should the filling be inserted before the removal or elimination of this substance, which of course spoils or prevents the adhesion of the cement, the result will be the loss of the filling within a few days.

The cement should be mixed to a creamy consistence, carefully spatulated to thoroughly incorporate the powder into the fluid and make it perfectly smooth; and with a fine-pointed instrument it is worked into all the undercuts of both cavity and filling; then the filling is placed in position and ligated with a heavy waxed ribbon floss, the surplus cement removed, a thick coating of sandarac varnish spread over the whole, and the patient is dismissed with instructions to remove the ligatures and varnish at the end of two hours.

THE COMBINATION OF GOLD AND PORCELAIN.

This has been recommended and the necessary procedure advised by Dr. Walter Wolfgang Bruck, instructor in the Dental Institute of the Royal University of Breslau, and has proved of great value in those cases where cavities were so large that matrices made from the thinner golds are sure to warp in the fusing of the body. He recommends the use of 34 to 36-gage pure gold plate for the matrix, which does not require an investment to protect it and can be placed into

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the cavity and the margins reburnished to a perfect adaptation just before the final fusing. That portion of gold which covers the bulbous part of the inlay is removed by cutting a groove around it with a knife-edge disk, leaving a pure gold gasket around the entire margin of the filling to be polished and burnished after it has been cemented and perfectly set. The only disadvantage or objection, if such it may be called, is the fine line of gold to be seen around them. I have inserted many fillings of this kind in the molars, in particular, with eminently satisfactory results to the patient and myself.

Cemented gold fillings I believe to be advantageous where extensive restoration of contour is required in the distal portions of the bicuspids or any of the surfaces of the molars. It would be absurd for me to waste your time and my own in dilating upon the technique of construction in this work, as you are to have two papers dealing with the subject exclusively.

I have, however, clinical matter in this line which I shall take great pleasure in showing you, and which I hope will carry conviction that gold foil as a filling material, as stated before, is seeing its last days.

The instruments and equipment necessary for the best results in any part of the procedure before mentioned are comparatively few and inexpensive. A Brewster screw press, two or three suitable glass or porcelain slabs, artists' camel-hair brushes from No. 1 to 9, a few small spatulas, varying in shape, a good electric furnace without pyrometer, a Taggart gold casting machine with sufficient stock, will equip one to produce results which will be extremely satisfactory to the operator and his *clientèle*.

CONCLUSION.

In conclusion: It has been my aim in this paper to give you in the simplest manner possible practical facts, purposely omitting any reference to the historical status of the subject and without attempt to analyze for cause and effect, because it is a physical impossibility to incorporate them with justice to the convention and myself. There are many considerations any one of which would make a paper in itself; for instance, a question of occlusion. If according to the new school of orthodontia malocclusion is a prominent factor in many of the ills that human teeth are heir to, an entire session could be profitably utilized in consideration of the same.

Finally, I want it distinctly understood that I am not depreciating the value that gold foil has possessed in uplifting the standard of our profession in the past, or the skill of the many who use it, but am entering a plea for the adoption of a very much easier, more humane, and practical method to succeed it.

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Discussion.

Dr. W. K. Slater, Knoxville, Tenn. The more one believes in the inlay, the less he will have to say in discussing this paper, except in commendation of it. I am heartily in accord with the essayist in his conclusions. I differ with him as to some of his methods, but what does it signify if they all lead with equal sureness to the desired end.

From the time when gutta-percha and cement were first used under metallic fillings to protect the more sensitive parts of the cavity, the idea of the inlay has grown and developed to its present fair proportions. The man who advanced the idea of forcing a mat of gold into a cavity lined with soft cement, and so manipulating subsequent additions of gold as to reduce the cement at the margins to a minimum, was very near the truth as presented by our essayist today. Circumstances have made it necessary in the past to insert many amalgam fillings in teeth that at the present time are being more perfectly restored and supported by inlays. Rarely have I found a cemented filling failing on account of disintegration of the cement, as the cavity will be found lined with it provided the patient does not delay too long the reinsertion of the inlay. Experience has shown recurrence of decay around a well-fitted inlay to be an almost unknown occurrence.

One reason for this lies in the carrying out of that generally accepted and well-founded theory of extension for prevention which, in successful inlay work, must to a greater or less extent be practiced, inasmuch as in this case the term successful refers more particularly to adaptation and anchorage. But taking the opposite tack, I am firmly convinced that cemented fillings with cavity margins in contact with the approximating tooth will outlast any other operation in similar environments.

The introduction of the inlay has made it practicable to save many teeth that until quite recently it was thought possible to save only by crowning. It is no longer necessary to temporize with cement in a large proportion of these cases where experience has taught us that such a method of procedure is indicated. The permanent teeth of children of any age may in this way be lastingly treated; in fact, in any place where a permanent filling is desirable but unadvisable, the inlay, combining the good qualities of what we have been pleased to term permanent and temporary fillings, fills a long-felt want.

The profession has been slow to adopt this method, but it possibly was from a desire to test its merits. But now that experience has proved it good, surely it will be generally adopted, and I prophesy that the cemented filling is to be to operative dentistry what crown and bridge work is to prosthetic dentistry.

Dr. J. Q. Byram, Indianapolis, Ind. I wish to congratulate the Committee of Organization upon the selection of so able an essayist to present his views on operative dentistry. Those of us who have been particularly interested in the inlay problem, believing as we do that the inlay is the filling of the future, are particularly interested in a paper of this kind. While I am as enthusiastic over inlays as my good friend Dr. Van Woert and

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others, I do not care to be quite as radical as he would seem to be. I still see good in gold foil, and I believe that the gold filling will be used as long as we need dentists. I have not come to the point where I believe the gold inlay is better than gold filling in small cavities on occlusal surfaces of the molars or in small approximo-occlusal cavities. There are certain cavities in incisors where I believe gold fillings are better than porcelain inlays. I have contended for some time that porcelain is particularly indicated in large cavities in the incisors and canines. While I fill small cavities with porcelain, I believe I am safe in saying that seventy-five per cent. of inlays I construct are for approximo-incisal cavities, rather than for simple approximal or labial cavities.

I wish to call your attention to one point in the essay. The paper as a whole is one with which I wholly agree, and inasmuch as my name was taken in vain, I wish to elaborate upon one or two of the statements. When I announced to the profession that any form of porcelain could be fused on pure gold I did not intend to infer that I considered it a practical method of fusing high-fusing porcelain. I was taught in my college days that the fusing of porcelain was largely a physical process by which certain ingredients fused and agglutinated, the mass thereby holding them together. Not being satisfied with such a theory, I began experimenting on the fusing of porcelain on pure gold. I have fused Consolidated porcelain, which fuses at 2600° F., on pure gold. It requires from eight to twelve hours to do it, therefore it is not a practical procedure in our work. I believe we have made a great mistake in the past in fusing porcelain too rapidly. I believe furnaces have been improperly constructed, because they produce too much heat at the beginning of the fusing process. I believe porcelain should be fused slowly for an increased time and at a lower temperature, thereby securing a stronger body of porcelain. I believe also that any of the porcelains on the market are strong enough. It is not a matter of strength of the porcelain, but a matter of the proper preparation of the cavity in which the porcelain is to be placed. If the cavity is properly prepared any porcelain, high- or low-fusing, will be strong enough, but if the cavity is not properly prepared no porcelain will afford sufficient strength.

I understood before the session convened that Dr. Van Woert's paper was to treat particularly on the impression method for the construction of inlays. Dr. Van Woert and I are not agreed on that part of inlay work. I believe I can construct better matrices for cavities in incisors and canines by burnishing directly into the cavity. Dr. Van Woert believes he can construct better matrices by taking an impression and constructing matrices from models. Now, as the speaker who preceded me said, we are after results. If we can accomplish better results by burnishing than by another method, let us not start trouble along that line. Because of the inaccessibility of the cavities and the difficulty of manipulating instruments in cavities in bicuspids and molars, I do believe that in most cases we can do better work by what is known as the impression method. I have been an advocate of the impression method for gold inlays, but we now have a better method, unless we choose to call it also the impression method, although it can hardly be considered as such, for the reason that in the impression method

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the matrix is constructed on a model of the cavity, and of course that is different from the newer method. For most cases of simple approximal and approximo-incisal cavities I burnish directly into the cavity, but for cavities on the labial surfaces of the incisors and canines I use the impression method; differently, however, from Dr. Van Woert. I take the impression in cement and swage directly over the impression rather than into the model of the cavity, according to the method suggested a number of years ago, I think by Dr. Taggart.

I use both gold and platinum for matrices. If I am constructing small inlays I use gold, but I do not invest the matrix. When the inlay becomes so large that it would be necessary to invest a gold matrix in order to prevent its warping, then I use the platinum matrix. Dr. Van Woert spoke of the operator being embarrassed by having to construct a new matrix. I admit that I do construct many matrices the second time, but I have not found it so embarrassing, because I have been careful to impress upon the patient that this work is difficult and has an element of uncertainty in it, and for that reason it does not embarrass me if I must construct a new matrix. I believe that the time consumed in constructing the matrix and inlay with the aid of a gold matrix when it must be invested is greater than the time consumed in constructing an inlay in a platinum matrix, because of the time consumed in cooling the invested matrix after each fusing. Dr. Ottolengui disputed this statement and tried to prove it by demonstration, but he failed.

Dr. Ottolengui. I proved it.

Dr. Byram. No, you did not; not to my satisfaction.

I will not say anything on the color phase of the work, because that is only a secondary statement in the paper, and is a subject which of itself requires much discussion. Dr. Van Woert claims that he can do better work with the eye than with the pyrometer. Now, that has not been my experience, and especially with high-fusing porcelain. I know that Dr. Van Woert uses low-fusing porcelain more than he uses the high-fusing. I use the low-fusing for nearly all small inlays, but for the larger approximo-incisal inlays I can obtain better color effects and better contour with the high-fusing than I can with the low-fusing porcelains. I have seen the work of a number of practitioners who use low-fusing porcelains, and I believe they could obtain better color effects and better contour in many cases if they used high-fusing porcelain.

I wish to congratulate Dr. Van Woert on this paper. It is a good one, and one which I hope will elicit a liberal discussion.

Dr. R. Ottolengui, New York, N. Y. I will venture to immediately follow the gentlemen who have been appointed to open the discussion, because I have brought something entirely new in this line which I would like to show. Dr. Van Woert has made a very good point in his paper to the effect that there will always be some necessity for a good method of making models of cavities upon which to prepare the matrix. Now, it matters not how expert one may become in working directly in the mouth, there will nevertheless occur cases where one will always prefer to work from the model, especially in those cases where one margin is below the gum; and no matter how perfect may be the visible edges of the matrix, there is a chance for an imperfect fit along the margin

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that is out of sight. We have reviewed the evolution of the various methods of making gold inlays until at last the genius of Dr. Taggart has given us a casting method which the entire profession has been swift to appreciate and adopt, and I found when I was in Chicago that another ingenious inventor of that city, Dr. Roach, had at last perfected a method of making models of cavities, also with a machine, and I asked him to allow me to have the privilege of bringing the device to this meeting, where almost your entire time is to be occupied with this subject. I hold this instrument in my hand and will quickly describe the method of operating it.

It consists of a cylinder, a plunger, and a base. Moldine is placed in the base, and the impression over it; the cement is then placed in the impression, and another layer of moldine over it, and then pressure is brought to bear on the whole with the plunger while the cement is in the process of hardening. In connection with this instrument there are also a number of ingenious little trays for taking the impression of the cavity. That is incidental; the main thing I wished to call your attention to was this device for swaging the model of the cavity.

I have only one more word to say, and that is in connection with the allegation made by Dr. Byram. It is a surprise to me that it has been so frequently said that if gold is used as a matrix it must be invested in order to prevent warpage. This is simply not true. The gold matrix may be advantageously invested in order that it may be more readily handled, but I am willing to demonstrate to Dr. Byram and to everybody present who is interested that porcelain may be fused in a gold matrix without investment and without shrinkage. The best proof I can give of that is to describe a case. The cavity, which had been caused by a badly fitting clasp on a molar tooth, involved nearly all of both approximal surfaces, and practically all of the lingual surface of that tooth had been attacked by caries. A gold matrix was made from this cavity and the form of this matrix was like the letter U. That inlay was made without investing the matrix. Now, gentlemen, if there had been any shrinkage these two ends would have collapsed and it would have been impossible to put the inlay into position, but it was made to fit perfectly.

Dr. T. P. Hinman, Atlanta, Ga. I would like to say just a word in reference to Dr. Van Woert's paper, for it has been my pleasure to see him in his office and know something of the results he obtains. His paper as a whole is an excellent one. Of course anyone working in porcelain is apt to go to extremes in it, and I think possibly the essayist has done so, in that he makes so many inlays, but I admit that I fear I am going to the same extreme.

The question of making a matrix for gold inlays simply resolves itself into one thing, and that is how can you individually best construct the matrix. I believe that some practitioners make better matrices in the mouth than they can from a model, and the thing for him to do is to make his matrix in that way. I think that in complex forms we all agree with the essayist that the model is the best method, but I do not believe that as satisfactory results can be obtained from that alone as when the matrix is made on the model and then re-burnished into the cavity direct. That is the method by which I have obtained the best results.

For porcelain I believe in practically

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the same methods. I do believe in reburnishing the matrix in the mouth, and I do not believe in the exclusive use of the model method. But now, gentlemen, what I have been saying is almost a piece of ancient history to me, because I have found something better, and I do not use the matrix any more. I simply mold my gold inlay in the mouth in wax according to Dr. Taggart's method—and to him should be the glory—forming the wax into a mold and reproducing that wax by the casting system, and I do not believe that there is any other method by which such a perfect gold inlay can be made, although my good friend Dr. Alexander will not agree with me.

In commending this paper to you it affords me a great deal of pleasure, because Dr. Van Woert is a personal friend of mine and a skilful operator.

Dr. Van Woert (closing the discussion). I simply wish to thank the members of the Convention for their kind consideration and reception of my small efforts in behalf of what I believe to be the coming scientific method in dentistry.

The next order of business was the reading of a paper by Dr. C. L. Alexander, Charlotte, N. C., on "The Evolution of the Gold Inlay."

Dr. Alexander. Being solicited by your representatives to prepare a paper for this meeting, I shall quote from the letter of invitation in order that you may understand my position:

I am authorized by the Committee on Organization to invite you to prepare and read an extensive paper on Gold Inlays at the meeting of the Jamestown Dental Convention. . . . As you are the virtual father of gold inlay work, we find it very appropriate that you, above all others, should give this paper. . . . I want to say to you that the whole Committee on Organization are unanimous in thinking that you above all others should be one of the essayists.

I could not do otherwise than appreciate and accept such a flattering proposition. Since this committee has credited me with the fatherhood of the gold inlay, and recognized my efforts in the development of the gold inlay system by extending to me the above invitation, my subject will be "The Evolution of the Gold Inlay, and Its Influence upon Operative and Prosthetic Dentistry." An extensive paper upon this subject, as suggested by the committee, would be appropriate for publication, but I did not think it wise to attempt to read such a paper, for fear that it would become irksome to my hearers. I hope, however, that I have presented the subject in such a way as to cover the field, and to create in you a desire to participate in the discussion—from which always flows the pure milk of the cocoanut.

In presenting this subject, the story at times will doubtless savor of egotism. As it will be impossible entirely to eliminate this feature, I will ask in the beginning that you bear with me should I indulge in this dangerous and detestable weakness to which men are so prone.

[See paper on opposite page.]

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The Evolution of the Gold Inlay, and Its Influence upon Operative and Prosthetic Dentistry.

By CHARLES L. ALEXANDER, D.D.S., Charlotte, N. C.

IT is not of paramount importance to the dental profession as to whom credit shall be given for originating any particular method which tends to elevate and extend the scope and usefulness of that profession, but it is of great importance to humanity that every votary of the dental profession be placed in possession of all new ideas pertaining to dentistry, with all improvements evolving from the original or parent suggestion, in order that he may become more proficient and give his *clientèle* the full benefit of ideas thus acquired. The broad and liberal-minded dentist of the present time recognizes the responsibility which devolves upon him in connection with his duty of preserving the health of the mouth and teeth of those under his care, and the decided tendency on the part of members of our profession to measure up to this responsibility redounds to their credit.

Possibly, save the interest manifested in prophylactic treatment, no subject in dentistry is claiming a greater share of attention at the hands of the profession than the gold inlay, and other methods depending upon the same principles involved.

The porcelain inlay, which appeals most to our esthetic nature, is still undergoing the test of time. Experience and observation cause me to believe that the porcelain inlay will retain a permanent place as a filling material, but I do not hesitate to say that many disappointments can already be credited to its account, and, as compared with the gold inlay it will only be able to look pretty and mark time while the many superior

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qualities of the metal inlay will force it onward to a destiny which will eventually revolutionize both operative and prosthetic dentistry as practiced before its advent. However, it is to be hoped that the dream of the most sanguine advocate of plastic material for filling teeth will be realized. The present state of the art in this direction looks most encouraging. A cement having all the qualities to meet the requirement of a filling material for the teeth would relegate to the past all methods now in use. Under such conditions the gold inlay principle would continue to be a valuable adjunct to dentistry, unless indeed some method not now apparent should be originated to subserve its purpose.

To attempt to give in detail the technique, or even a creditable mention, of the many methods employed in constructing the gold inlay, or to call your attention to the many applications which are now made and can be made of the inlay principle, would require more time than has been allotted to me. Therefore I will confine myself more particularly to my own experience, outlining my first conception of the inlay idea, and modestly elaborating only upon such methods as are original with me and appeal to me as having special merit.

It was observing the ease with which gold solder could be fused and manipulated in reinforcing platinum foil, which I used in making anchorage fixtures for orthodontia cases, that suggested the gold inlay and gave me the first insight as to its possibilities. Upon this basic principle I have labored for the past twenty years, and it is a source of great satisfaction to note the results accomplished by myself and others.

The gold inlay has a practical place in operative dentistry; it can often be used to advantage in the more simple cavities, and is almost indispensable where more complicated restorations are to be made, the demand being chiefly confined to bicuspids and molars. However, its use, where indicated, upon the anterior teeth cannot be deprecated, from the fact that it is many times stronger for the amount of bulk than any other filling material.

Some of my first experiments were made upon the anterior teeth, in correcting the ravages of erosion and abrasion. Such work required delicacy and strength. The gold inlay proved to be the master of the situation, and it remains so to this day. Strength was given these plate protections by simply sweating a little gold over them. Where demanded, in order to secure the necessary contour, after burnishing platinum foil over the abraded surface and providing it with a pin anchorage, I would produce the contour by building up with wax, then investing and mounting this nucleus of the prospective inlay, or cast filling, as I then called it, upon one jaw of a pair of laboratory pliers, attaching the counter investment to the opposing jaw. After heating, separating, and boiling out the wax, I would place a sufficient quantity of 24-karat gold within the mold; heat it to the boiling-point and close the parts together, thus securing the desired form for my cast filling. In trying to improve upon this primitive method, it occurred to me that the wax restoration could be covered with platinum foil, leaving some accessible surface uncovered through which to boil out the wax and introduce the gold after investing. The metal-lined matrix simplified the work very much, as the gold would, when fused, flow to all parts of the matrix without the aid of pressure.

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These inlays when finished showed a discoloration along the marginal line, due to the presence of the platinum. Later this objectionable feature was eliminated by substituting No. 120 rolled gold foil for the platinum. I afterward suggested the use of gold plate 0.003 of an inch in thickness, for the base of the matrix, and 0.001 of an inch for covering the wax contour, these thicknesses having been determined after many tests.

Following my success with the anterior teeth, I met with equally satisfactory results in making gold inlays for the approximal, buccal, and fissure cavities of special magnitude, the methods of anchorage depending upon conditions to be overcome in each particular cavity, care always being taken to provide a substantial seat for such inlays as receive the stress of mastication.

Another step forward in the development of this work was the idea which I conceived of stamping up the cusp in making large restorations for the bicuspids and molars, filling the intervening space between the base of the inlay and the cusp with solder. From this idea was evolved the Alexander hood and saddle crown, which should be used more extensively for abutments in artistic bridge work. I do not hesitate to claim for these partial crowns, when used as individual crowns or bridge abutments, where conditions will admit of their use, superiority over all other substitutes. They are artistic, esthetic, hygienic, and non-irritating. I still hold to the claim which I made for them in a paper I read before the Chicago Odontographic Society last March, as to the limited area of the tooth-surface covered, holding that a tooth hermetically sealed within a shell crown does not retain its vitality and its harmonious and healthy relation with the surrounding tissue, as does a tooth having a partial crown. I suggested as the cause that this condition was probably brought about by the cutting off of the tooth-surface entirely from all atmospheric and other external influences which have so much to do with vitality and life. I especially invite your attention and investigation regarding this point. The paper referred to was published in the June number of the *Dental*

FIG. 1.

FIG. 2.

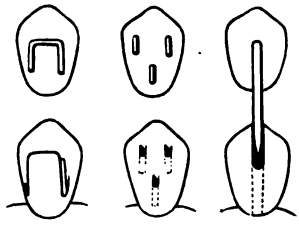


FIG. 3.

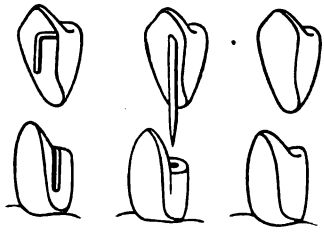
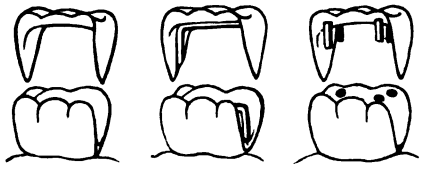


FIG. 4.



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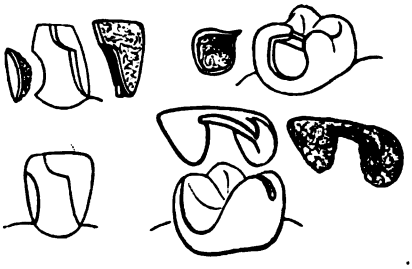
Review. Those of you who are not familiar with the technique of these crowns would be interested in that publication.

The preparation of cavities for the gold inlay differs very materially from that of cavities where porcelain is to be

Fig. 5.



used. When using porcelain, the walls of the cavity should be as near at right angles as possible, to permit the free withdrawal of the matrix. This is also necessary in order to get edge strength for the inlay. The uniformity of thick-

Fig. 6.

Fig. 7.

ness gained by conforming a porcelain inlay to such a cavity is very important, as it plays a part in the color theme.

In preparing cavities for the gold inlay, better results are obtained with beveled margins, thus securing an inlay with thin edges that can be burnished to a more perfect adaptation to the tooth. In making the gold inlay, it is only in the smaller cavities that we are dependent upon the walls of the cavity for retention. In complicated cavities in bicuspids and molars requiring a saddle inlay, the walls of the cavity are not taken into consideration; in fact, they can be obliterated entirely by filling in with cement, grinding and providing the tooth with a concave surface extending across the occlusal surface and extending down labiolingually upon the approximal surface to the cervical margin, or at least far enough to include the slight bevel at the margin of the cavity. The inner and sometimes the outer cusp, where the standing walls are entirely separated by extensive decay, are slightly flattened to give the inlay a more perfect seat. When this precaution is not taken, there is some danger of splitting the tooth in the process of mastication. Fig. 1 represents such a tooth, showing the cavity prepared and the inlay ready to be cemented to place. If the hood or saddle inlay is to be used for an abutment, it is provided with pins or staples to secure a stronger anchorage.

Figs. 2, 3, and 4 represent the various forms of the hood and saddle inlay or crown, showing the tooth as prepared and the several methods of securing an anchorage.

It was my pleasure to inspect some of the beautiful specimen work made by Dr. Taggart of Chicago, to demonstrate his compressed-air method of making gold inlays. At first my enthusiasm for the method was overwhelming, but upon reflection I do not feel so sanguine concerning its success from a practical standpoint. I doubt his ability to secure the wax form in difficult cases, and even

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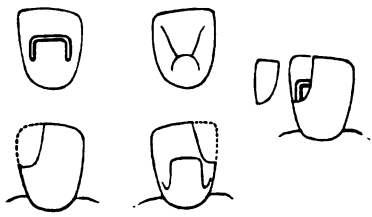
should this be possible, I doubt his ability to make these or the most simple inlays in the same length of time that they can be made in a less complicated way, taking into consideration the time required in the various steps of procedure in working out his method.

All men of experience realize that simplicity of technique is the greatest virtue in any method of making the gold inlay. For the past six years, I have been experimenting with sponge gold in the construction of these inlays. At first, in order to eliminate every feature which consumed time, I would secure a gold matrix, would pack it with moss fiber or some other form of this gold, and upon the latter would sweat 22-karat solder to give it solidity, the entire operation being done without investing. I now make many inlays without a matrix by packing the cavity solidly with some form of sponge gold, restoring the contour when necessary, removing and investing, leaving uncovered a surface sufficient for sweating in the solder to make a solid mass. No time whatever is lost while waiting for the investment to set, for being made on a piece of paper placed on a wire gauze soldering frame, the heat is applied at once, the paper destroyed, and the soldering accomplished. In this way an inlay can be made in about the length of time it takes to secure a matrix or to dry out an investment. When making the larger inlays by this method a foil matrix is used; this is easily made by covering the cavity with a piece of No. 30 rolled gold, and then pressing in upon it a single piece of sponge gold large enough to fill the cavity. I make many of these sponge gold inlays without the aid of the matrix or an investment. (See Fig. 5.)

In the use of sponge gold, where it becomes necessary to protect cavities from a recurrence of decay, the beveled portion is allowed to extend well out beyond the susceptible areas, the cavity being so prepared internally that the sponge gold can be packed within, removed and solidified with 22-karat gold solder, then replaced to serve as anchorage for the inlay, which is completed by burnishing a plate of 0.003 gold over the parts, and

Fig. 8.



then removing it in order to tack the anchorage piece to its place. After this the plate with the anchorage attached to it is replaced upon the tooth, burnished and trimmed to a perfect fit; the contour is then restored with sponge gold, and it is removed and solidified with 20-karat gold solder. All of this is done without investing. Figs. 6 and 7 illustrate these inlays and the method of cavity preparation.

The influence the gold inlay has had upon operative dentistry is decided and pronounced. Cavities in inaccessible teeth are now perfectly filled, it not being necessary to adjust the rubber dam. Many such teeth were formerly extracted or provided with a shell crown, a more or less imperfect and therefore unclean substitute. The long and tedious filling operations, so trying to both patient and operator, are a thing of the past. The adoption of the porcelain and gold inlay makes these operations a pleasure. The gold inlay, used in combination with

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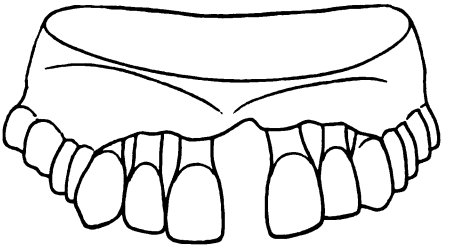
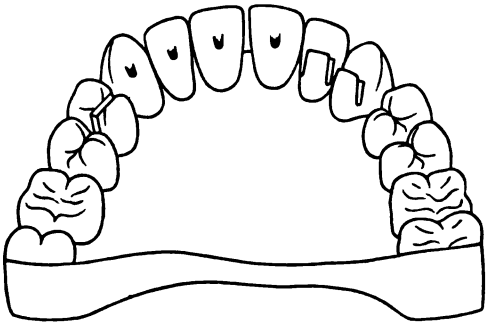
porcelain is strong and esthetic in appearance, and should be taken advantage

Fig. 9.



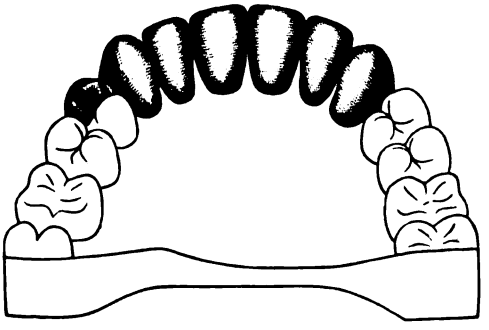
of by operators in restoring the anterior teeth or for making bridge abutments. (See Fig. 8.)

Fig. 10.



A practical knowledge of the inlay principle in constructing bridge work

Fig. 11.



enables the operator to avoid a display of gold, which has become so objectionable to the sensibilities of the more refined element of society.

Fig. 12.

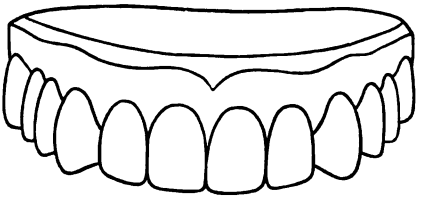


Fig. 13.

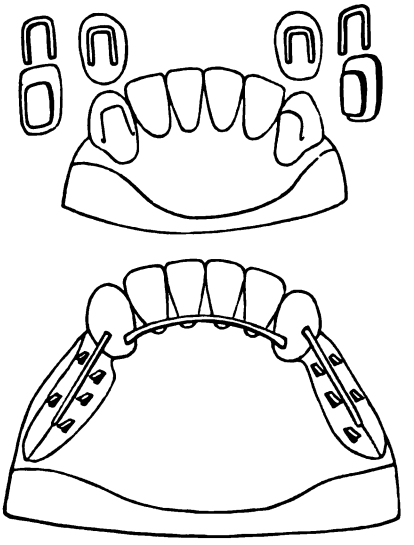
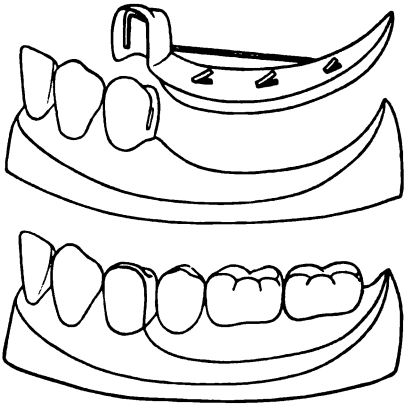


Fig. 14.



The practical application of this principle in binding together teeth which

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have migrated and lost their stability through pyorrhea alveolaris delights the patient and restores his teeth to many years of usefulness. But for the gold inlay principle, such teeth would be condemned as worthless. (See Figs. 9, 10, 11, and 12.)

I have not given so much study and attention to prosthesis, as understood in dentistry, as I have other departments of my profession; but I am satisfied that the advent of the gold inlay marks an era of progress in that branch of dentistry.

About the year 1886, it was my good fortune to devise the telescoping anchorage denture. The display of gold being very objectionable, you can imagine my delight when I was able to substitute the telescoping hood (of gold inlay origin) for the unsightly telescoping shell crowns. These anchor plates are very satisfactory, but doubtless they could be further simplified. My opinion is that the Roach ball-and-tube anchorage, used in connection with the hood inlay protection, would make a very desirable improvement. The hood inlay saddle extension plate with rubber attachment for the teeth is a side development of the gold inlay principle. (See Figs. 13 and 14.) Where indicated, these plates when skilfully made furnish an artistic and unique substitute. The sanitary aspect is not objectionable, as my observation has proved. I simply call your attention to the above devices to show the possibilities of the gold inlay principle and its influence upon prosthetic dentistry.

Discussion.

Dr. H. H. Johnson, Macon, Ga. In the beginning I wish to thank Dr. Alexander for this paper and for the great work he has done for humanity and the profession in developing this system of work, which should forever bear his name. As he says, "it matters not to humanity who originated the idea," if perchance it may ever be known who really made the first suggestion along that line. But on the contrary, I hold that it does matter to the profession who should be given the credit for originating an idea that could be developed and fashioned into such a beautiful and valuable system of work. This, like a great many other systems, has been so gradually evolved that it will be impossible to give credit where it properly belongs. So many active minds were working along the same line; ideas were springing from so many sources, that history becomes quite conflicting. I shall not, therefore, attempt to fix the credit for the originator of the thought, but that it may be shown that many were attempting the same class of operations about the same time, I wish to submit a few facts from the records.

The first paper bearing on this work of which I have any knowledge was one by Dr. S. W. Foster of Georgia, and read before the Southern Dental Association at Old Point Comfort, August 2, 1894. This paper had for its title, "Some of the Merits of Contour Fillings

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Made in the Laboratory." It described the technique of building up an incisor fractured two years previously. The operation was described as being done by burnishing thin platinum over the broken surface of the tooth, drilling three parallel pinholes for platinum pins, building up with wax to the desired contour, burnishing platinum over the outer surface of the wax, investing, washing out the wax, and filling in with 22-k. gold solder. Dr. J. Y. Crawford in discussing the paper approved the idea, but differed with the essayist in regard to the platinum matrix, advocating the use of 24-k. gold instead. (See *Dental Cosmos,* vol. xxxvi, page 720.)

Before the Southern Dental Association at Asheville, N. C., July 28, 1896, Dr. C. L. Alexander read an elaborate paper accompanied by many beautiful illustrations, some of which we see in text-books of today, setting forth substantially the developed ideas of the Alexander system of "cast fillings" and "hood abutments." That the technique of Dr. Alexander's work was not materially different from that of Dr. Foster, I will show by quoting from his paper of that date. He says, "The fundamental principle is an old one, that of fusing and flowing metal over platinum sheet or foil. My method consists in detail of burnishing platinum over the surface to be restored," etc. [See *Cosmos,* vol. xxxviii, page 851.] Dr. Foster, in discussing the paper, again referred to his paper of 1894, and also to the case at that date described as still being in a perfect state of preservation, and still called them "laboratory fillings." He highly commended the work of Dr. Alexander, as being perfectly practical and durable and a great advance step in dentistry. Dr. Crawford, as before when discussing Dr. Foster's paper, still insisted that 24-k. gold should be used for the matrix instead of platinum, and referred to a method of Dr. G. V. I. Brown's for making a "cast filling" that he liked better than either of the two. Various speakers raised the question of the durability of the cement, and Dr. Alexander replied that "he had been doing the work for some time, and had never had a failure." Indeed, the progress of the development of the work, as illustrated by Dr. Alexander, showed conclusively that he had had vast experience which must have extended over a long period of time, which had it been made known in the beginning might, unquestionably, have given him full credit for the first original ideas.

Be that as it may, being in a position advantageous for observation, I can say with positiveness that Dr. Alexander has done more and accomplished more with this system of work than anyone else who has ever undertaken it.

Apologizing for taking up so much time with these preliminary remarks, I wish to say a few words as to the practicability of the work. One of its main points of excellence is that it restores broken-down molars without the use of any irritating band, and is of sufficient strength and durability to form a safe attachment for a reasonably long bridge. The hood abutments for canines and bicuspids cannot be too strongly advocated. To be able to preserve the health and vitality of sound teeth, and at the same time to be able to make a good strong safe attachment for a bridge without any appreciable display of gold, fills me with gratitude to Dr. Alexander every time I have an occasion to make one, which now is quite often. For opening the bite in the presence of abraded teeth—such as

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those of tobacco chewers—as a substitute for gold crowns with their miserable unhealthy bands, for building up and restoring thin frail teeth, and for affording a protection that gold foil cannot give, the work commends itself to every progressive operator.

Dr. THOMAS P. HINMAN, Atlanta, Ga. I am glad to be able to say just a few words about Dr. Alexander's work. It was his work that really first attracted my attention, and it was through him that I took it up. Now, I want to say that he does not look as though he were an old man, but he is my "daddy" in gold inlay work, and he probably is the "daddy" of gold inlay work in the South, if not in the whole country. It is absolutely wonderful to see the results that he obtains. His methods are original and his work is beautiful. It has been my good fortune to see work of his of several years' standing in the mouth, and I am very sorry to say that I cannot measure up to the high standard that he sets, and for that matter I think very few others can.

I would like to offer just a few words of criticism concerning his method of cavity preparation. I notice that he has not adopted the flat floor or square basal wall that is made by the fissure bur on which the cervical portion of the filling must rest.

Dr. ALEXANDER. Allow me to suggest that in one of the cases shown I have followed that method, but I have not much confidence in its merits.

Dr. HINMAN. I thought you did not believe in the value of that method, and that is why I mentioned it. I consider it essential in this work that the buccal and lingual cervical angles should be cut away square; that you should follow the method of cavity preparation as advocated by Dr. Black. That is my practice.

One other point, and that is the question of placing the bar in the partial lower plate. I have made many of these substitutes, and find that if the bar is placed in the position as indicated, it will push the lower incisors forward, and in order to prevent that mishap the bar should be brought down below the teeth and under the tongue to a point where it does not interfere with the articulation or press against the lower incisors.

Dr. Alexander spoke of the rapidity of his method. There is no question about the rapidity of this method when sponge gold is used. I have never used this method for obtaining contour restorations, but unquestionably it must give beautiful results. I have never seen it, but those who have say it is beautiful, and I am sure that Dr. Alexander would not use it unless it was well-nigh perfect.

Now, the essayist has one word of criticism in reference to Dr. Taggart's cast inlay made from the wax model. He says he does not believe it will give a perfect impression in wax and produce a perfect inlay. That is his only contention. The beauty of this method is that the more complex the case is, if the cavity is properly prepared, the more perfect the work can be made. And you can make your cast inlay in less time where it is complex than by any other known method. For simple cases, in all probability, Dr. Alexander may make an inlay more rapidly than with the wax method, but for a complex cavity it can be done more rapidly by Dr. Taggart's method. Now, it is a matter of record that Dr. Taggart made a cast inlay from the start to the finish in twenty minutes. That is pretty fast time, I think.

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Dr. ALEXANDER. It was for a very simple cavity, though.

Dr. HINMAN. It was for an approximo-occlusal cavity in a bicuspid. And a compound inlay can be made very much more simple by carving in wax than by the matrix method.

Just a word with reference to the hood abutment. The greatest advance of the past decade in bridge attachments has been the hood abutment. Hoods do more to produce cosmetic results than anything I know of; they conserve the pulps of teeth and also the tooth-structure, and are permanent, not temporary attachments. I have had the opportunity of seeing many of these hood abutments from the hands of Dr. Alexander which have been in the mouth for years, demonstrating the fact that this is a permanent form of attachment. I have used hoods successfully in my practice for over eight years, and they make a permanent attachment, as well as conserving the pulp and tooth-structure: I really think that too much credit cannot be given to Dr. Alexander for this work. He has been a pioneer, and has carried it to such a state of perfection that we can all well follow in his steps.

Dr. J. Y. CRAWFORD, Nashville, Tenn. I cannot forego the pleasure of saying a few words on the very splendid contribution we have had from Dr. Alexander, and I can say in all truthfulness that no man has more earnestly encouraged him in this work than myself. I had an occasion once to introduce him to a public audience, and it was my pleasure in that introduction to say that he was one of the greatest of American dentists, and I repeat that statement now. He is certainly entitled to much credit for detail work, and as his friend I want to say that the contribution in the aggregate is valuable, but the fundamental idea of the present system of the treatment of dental caries and other pathological conditions of the human teeth by the process of inlaying or onlaying I do not think is original with Dr. Alexander, and as a matter of fact it would be difficult to determine as to its priority.

I have never claimed priority in anything, but many years ago, when I was practicing in a little town in western Tennessee, in about 1876, I was called upon to build out about one-third or one-half the entire crown of a central incisor. In this case, in order to secure a better attachment for the gold, I placed in that tooth three guide or dowel pins. I cannot recall the patient's name, but some time afterward, when I had a specially desirable patient in my office, and one on whom I was anxious to make a good impression, this patient came to the office and said, "Doctor, here's your tooth." I took the filling and slipped it back into position, scratched my head over this problem for a few minutes, and then mixed some cement and cemented it back to place, and I saw that patient seven years after that with the filling still in good condition. Now, I really think that the fundamental idea of the present mode of treatment of dental caries by the various forms of inlaying originated just in that way. I think it is a good idea to be correct in our conception of the origin of an idea, just as I think it is important to be correct about the etiology of disease, and I have tried to emphasize that thought.

One thing that has discouraged me, and is making me have anxious thoughts today upon this question of dental surgery in the aggregate, is the slowness with which the profession grasps the sim-

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ple problems, such as the use of these three pins, which some call dowel pins and some call guide pins.

I remember many years ago, when I was giving a clinic before a society, a patient was in attendance presenting a space caused by the loss of the upper left lateral incisor—and here I may say that the upper left lateral incisor is lost more frequently than any other tooth in the upper jaw. I have known that for a long time. There were several clinicians present and I called on seven of those present to tell in what way each would treat the case. Each proposed a different method of treatment, and even today. gentlemen, dental surgery is not ready to answer the question as to the best method of treating that edentulous gap made by the loss of the left lateral incisor.

Dr. Alexander,—What you have done, sir, in awakening the conception of the profession to the vast possibilities of this method, is worth a thousand times more than any one little original thought. Dental surgery can now grasp the value of fastening that inlay with the three dowel pins or guide pins upon the palatal surface of the tooth, and I believe all present will indorse it as the best method of supplying an upper left lateral incisor.

These few remarks are only made to emphasize the value of this kind of work. I have never appeared before a body of students but what I have said that the future method of treatment of caries in the front of the mouth would be by the construction of porcelain inlays, and posterior to the caries by metal inlays.

I want to encourage the study of the inlay; I want to encourage the utility of the dowel pin or the guide pin in retaining the inlay, but we want to remember that this idea in all probability originated away back in the early days of our history. A lady from a town in Kentucky came to my office the other day in whose mouth I had inserted one of the best contour fillings I ever put in in a left central incisor. She came with the filling in a neatly wrapped package, and said, "Doctor, here's your filling." Every man who is capable of being a dental surgeon knows how bad that makes the dentist feel. The man whose skin is so thick that he is not mortified by such an incident is lacking in one of the elements that go to make up a dental surgeon. I mixed up some cement and cemented the filling back to place and it is giving good service today. That was many years ago; on the visit the other day, she had lost a contour filling that I had placed on a molar, and she said she was mighty sorry she had lost that one. She said she wished she hadn't lost it, and that I could put it back like I did the other one. That, gentlemen, is where the conception of the modern inlay originated. I think that is where the idea was born which, in all of its beauty, all of its excellence, and all of its efficiency, has been brought out by Dr. Alexander.

Dr. W. T. Fleming, Richmond, Va. I feel very much indebted to Dr. Alexander for the paper, and for what I have learned from him with regard to inlay work.

I appreciate very much the point that Dr. Alexander brought out in regard to complicated methods of producing results. I do not think it should be our aim in dentistry to evolve any more complicated methods of practice than we have at present, if by simple methods we can produce the same results. I have always felt that we should have a sufficient number of instruments to enable us to do our best, but that number should

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be limited to as few as are compatible with efficient work. When we have a few instruments or a limited amount of paraphernalia with which to produce results, we naturally become more skilled in their use.

I would like to mention one point in the building of inlays that I have found very valuable, and that is, that instead of using moss fiber gold, which we know pits occasionally, I first flow a lower karat of solder in the matrix—say 20-k.—to strengthen it, then flow 22-k. to build the contour, heating this from the bottom, slowly, until the 22-k. solder begins to sweat; then throw over that the brush flame, and this lower-karat solder rising to the top produces a homogeneous mass in which pits are seldom found.

I want to thank Dr. Alexander for the method. I believe the inlay has come to stay, and that the gold inlay is the strongest and most durable of all inlays.

Dr. ALEXANDER (closing the discussion). I really have nothing more to add. I wish to thank the gentlemen for what they have said, and I feel very much flattered by the reception of my paper. I wish to say that I have a number of models showing this work, which you are all at liberty to examine, in which you will possibly see some points that were not brought out in the paper.

I thank you very much.

There being no further business for this session the convention adjourned until the evening session.

THIRD SESSION—Wednesday Evening.

THE meeting was called to order by the president, Dr. Turner, at 8 o'clock Wednesday evening.

Dr. THORPE presented the nomination of Dr. M. Pflüger, Hamburg, Germany, as an honorary vice-president of the convention, and offered the apologies of the Committee on Organization to Dr. A. W. Harlan, New York, whose name as vice-president, by a typographical error, was omitted from the program.

Motion was made and carried that the gentleman be elected to the office indicated.

Report of Committee on President's Address and Miller Memorial.

The Committee on the President's Address, through its chairman, Dr. B. L. THORPE, presented the following report:

We, the Committee on President's Address, beg leave to report as follows:

We appreciate and indorse the patriotic and professional sentiments as expressed by our honored president in the address; and we indorse his suggestion and recommend that a suitable number of pages be set aside in the published minutes of this convention as a suitable memorial to Professor Miller, whose death we deeply deplore.

BURTON LEE THORPE, *Ch'man*,
A. R. MELENDY,
JAMES MCMANUS,
Committee.

The following memorial notice of Professor Willoughby Dayton Miller was subsequently prepared on behalf of the convention by the same committee:

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In Memory of Willoughby Dayton Miller, A.B., D.D.S., M.D., Ph.D., Sc.D.

The officers and members of the Jamestown Dental Convention in session September 10, 11, and 12, 1907, deeply deplore the recent death of Professor W. D. Miller, who was to have been the principal essayist at this convention. His passing has removed the greatest scientist that dentistry has yet produced. His many years of untiring labor, his earnest zeal, inexhaustible enthusiasm, and his wonderful contributions to our science have endeared him to those who knew him and have made each dental practitioner his debtor; and we, the officers and members of the Jamestown Dental Convention, herewith express our appreciation of his great services to our calling, and offer our sincerest sympathy to his family in their great loss.

WILLOUGHBY DAYTON MILLER.

Willoughby Dayton Miller, son of John H. and Nancy L. Miller, was born at Alexandria, Licking county, Ohio, August 1, 1853. Here he resided until the age of thirteen, and attended the public school. During vacation period he worked on his father's farm. In 1865, with his family, he moved to Newark, Ohio, where he attended high school, from which he was graduated in 1871. Immediately following this he entered the University of Michigan at Ann Arbor, from which he graduated as B.A. "with eminent rank" in 1875. In the autumn of that year he went to Scotland, and entered the University of Edinburgh, where he studied under Sir William Thomson and took a special course in chemistry, philosophy, applied mathematics, and physics. Here he continued until 1876, receiving honorary mention for his laboratory work and also a prize offered by Professor Tait for the best essay on a specific subject. He next went to Berlin, where he entered the university and continued his studies. In 1877 a physical and nervous breakdown in his health forced him to suspend his studies. When convalescent he formed the acquaintance of Dr. F. P. Abbot, an American dentist practicing in Berlin. Dr. Abbot submitted to his chemical knowledge a number of professional problems, and thus Miller became interested in dentistry; he was influenced to change his life-work, and began the study of dentistry in Dr. Abbot's office.

He returned to America and attended the Pennsylvania College of Dental Surgery in the session of 1877-78, finishing his course at the dental department of the University of

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Pennsylvania in 1878-79, from which institution he was graduated as D.D.S. He received a prize for the best essay on "Conservative Treatment of the Dental Pulp."

He returned immediately to Berlin and entered practice with Dr. Abbot, and also began the study of bacteriology with the famous Professor Koch. He at once became interested in solving the problems regarding the etiology of dental caries, which interest eventually resulted in the greatest triumph that has yet been achieved in dentistry. He entered into this research work with characteristic zeal and enthusiasm. He soon obtained a large and select *clientèle*, among them various members of the royal family. In 1884 he was made professor of operative dentistry at the newly-founded dental department of the University of Berlin, the first professorship ever conferred upon a foreigner, and received the title of *Royal professor*. His title was subsequently raised to that of *Professor extraordinarius* in the medical faculty of the University of Berlin. This was a government appointment, one only conferred on men of acknowledged high scientific and professional standing. About this time he was also appointed State Examiner for Dentistry in Berlin. In 1887 he took the "Rigorosum" examination for the medical degree, which he successfully passed, with the predicate of *magna cum laude*—thus establishing himself firmly in the German university. Prior to this time he had been bitterly opposed by the German dentists, who had sent repeated petitions to the Minister of Education asking that his services be dispensed with and a German be appointed in his stead. From that time until the day of his death he was highly respected by German dentists, and was honored by them repeatedly. He was president of the National Dental Association of Germany and the Association of Dental Faculties of Germany. He was president of the American Dental Society of Europe, and at the annual meeting of the Fédération Dentaire Internationale at St. Louis in 1904 was elected president of that organization, an office he was to hold until the convening of the Fifth International Dental Congress at Berlin in 1909. He was an honorary member of some forty different dental societies. In 1885 the University of Michigan conferred upon him the honorary degree of Doctor of Philosophy, in 1902 the University of Pennsylvania the degree of Doctor of Science. The Fourth International Dental Congress at St. Louis, 1904, bestowed upon him a gold medal for his great paper entitled "A Study of Certain Questions Relating to the Pathology of the Teeth." In 1906 the Dental Society of the State of New York made him a fellow of that society and awarded him the society's gold medal "for distinguished contributions."

On September 28, 1906, the German Emperor appointed him as *Kaiserlicher Geheimer Medizinalrath* (medical privy councillor to the emperor), in recognition of his scientific attainments and his contributions to education.

From the very first of his professional career he has been a most indefatigable student, spending many hours in his laboratory in experimentation, and with his literary work—by no means confined to English, for the majority of his articles have been written and published in German, a language as familiar to him as his native tongue. His most notable works are his books, "Microorganisms of the Human Mouth," and "Lehrbuch der Konservierenden Zahnheilkunde" (Text-book on Conservative Dentistry), besides over one hundred separate publications of from two to one hundred pages. A list of his publications, as printed in the *Dental Cosmos*, is appended to this notice.

His early observations were published in the *Independent Practitioner*, edited by Dr. W. C. Barrett of Buffalo. These papers gave to the dental world the result of his investigations, and attracted much attention as well as opposition. Prior to his death Dr. Miller had been trying for a number of years to arrive at the cause of so-called erosion of the teeth. This was to have been the subject of his address before the Jamestown Dental Convention.

Dr. Miller was an enthusiastic athlete, and held the golf championship of Germany and Austria. He was deeply interested in the subject of philosophy. He was a republican in political opinions and was a member and treasurer of the American Church in Berlin. He was a member of the Psi Upsilon college fraternity and a member of the supreme chapter of the Delta Sigma Delta fraternity.

He married, in Berlin, October 26, 1879, Miss Caroline Abbot, the daughter of his pre-

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ceptor. To them were born three children—John, now a medical practitioner in Berlin; Kathryn Olive, now Mrs. W. G. Cady of Middletown, Conn., and Annabel Edna.

In the spring of 1907 Dr. Miller resigned all his dental society and college affiliations in Germany and returned to America, where in October 1907 he was to have begun as dean and professor of dental pathology and histology of the department of dentistry, University of Michigan, a position to which he had recently been elected. Here his work was to be the training of young men into scientific workers for our profession. He had returned to America and was visiting his old home at Alexandria, Ohio, where he suffered an attack of appendicitis. He was operated upon, but did not rally from the operation and died in the City Hospital, Newark, Ohio, Saturday, July 27, 1907.

W. D. Miller had for his motto one word—"Work." There were not enough hours in the day for his labor, and he borrowed much of the night. His fame and the great good he did for dentistry and humanity was the outcome of tireless industry and application, and that alone.

Respectfully submitted,

BURTON LEE THORPE, *Ch'man*,
A. R. MELENDY,
JAMES MCMANUS,
Committee.

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The report was adopted and ordered printed in the Transactions.

The next order of business was the reading of a paper by Dr. R. OTTOLENGUI, New York, N. Y., on "The Purposes and Accomplishments of Modern Orthodontia." (See opposite page.)

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The Purposes and Accomplishments of Modern Orthodontia.

By RODRIGUES OTTOLENGUI, M.D.S., LL.D., New York, N. Y.

WHAT is "modern orthodontia"? By this term I do not mean to differentiate between one school and another; the modern orthodontist is not necessarily a member of any clique, or class, or clan. Modern orthodontia is the orthodontia of today in contradistinction to the art of yesterday, just as modern dentistry differs from the dental science of twenty years ago. I must dwell a moment upon this point. There may be some who will argue that the differences between the today and the yesterday in orthodontia are so great that the modern orthodontist is a newly created being, the product of entirely new teaching and the practitioner of a totally new art. They will point out the radical differences between the past and the present in proof of their contention. I shall myself indicate some of these radical differences, but I shall speak of them merely as stages of progress, not as factors in invidious class distinctions. Similar and quite as conspicuous differences between the past and the present may be found in other fields. Indeed, the most radical innovation upon a long-established dental method is the evolution, now nearly completed, in the art of filling teeth. The mechanically secured metallic filling is slowly but surely being abandoned in favor of fillings retained by cementation. The chief work of this carefully planned dental convention is the exploitation of this idea. This is modern dentistry, and modern orthodontia has made no greater departure; yet I do believe that there is a line of demarkation in orthodontia which is quite as important, quite as radical.

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ORTHODONTIA OF THE PAST.

In order that we may fully comprehend the period which marks the beginning of a new era in orthodontia, let me briefly sketch its early days. Long before the word orthodontia was coined we spoke of "irregularities of the teeth" and the "correction of irregularities," or, otherwise, "the straightening of teeth." I shall not probably reach a better point at which I may tersely differentiate between the old and the new in orthodontia. Formerly the straightening of teeth was the primary aim of the operator; now it is but an incident in the everyday work of the orthodontist. Yesterday, the tooth-regulator tirelessly worked to place teeth in a symmetrical alignment; today, the orthodontist aims to restore occlusion, thus establishing normal functioning of the dental organs. In the past, teeth were placed where they would look pretty; in the present, they are moved so that they will be the most useful.

In the early days the mother noticed when the teeth were shed that her baby's new teeth were "coming in crooked," and in alarm she hurried to her dentist to know what was to be done; and at that time the mother instinct was wiser than the dental knowledge of the day, for the dentist usually advised delay and "giving nature a chance," not realizing that delay gives nature no chance whatever.

At the age of twelve or fourteen, however, the patience of parents usually ended, and dentists were compelled by importunity to "do something." Then what occurred? To this point I request your particular attention. In such predicaments, the dentist usually made models and studied the case. He studied the case as a problem by itself—a case to be treated, and if possible corrected, exactly as though there never had been another like it in the world. He made his diagnosis in accordance with what he felt capable of accomplishing, and he designed appliances to aid him in his work. If he made a conspicuous success he proudly wrote a description of his management of the case and published it, with illustrations of his fixtures. The early history of orthodontia is crowded with articles of this sort—individual cases, treated in accordance with individual ideas and with appliances specially designed for each particular case. The modern orthodontist glances through these articles and feels sorry for those early workers, struggling without knowledge to accomplish results which they scarcely comprehended themselves. Yet these men were the pioneers, and without the foundation which they laid the edifice of modern orthodontia never could have been erected.

While, as I have said, special devices were made for each case, those men who developed a fondness for the work, and thus attracted to their care any great number of cases, very soon noticed certain features common to many cases; and from that time on appliances were recommended that would do certain work in any mouth—as, for example, fixtures for widening the arch; the use of bands cemented to the teeth; the expansion arch wire; jack-screws; spring wire appliances, etc. And as these grew in number, so-called "systems" began to arrive. Of the systems we have several which bear the names of those who have devoted themselves each to the elaboration of one. But the advent and perfection of none of these systems has made that great impression upon orthodontic practice to which I have alluded as establish-

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ing a demarkation between the old and the new ways. True modern orthodontia dawned with the announcement by Angle of his classification of irregularities, which since then has come to be a standard for both diagnosis and prognosis.

THE ANGLE CLASSIFICATION.

Just as many practitioners observed that a majority of cases require so-called widening of the arch, Angle noted that many other features were common to many mouths. By closely studying the models in his own and other cabinets he finally evolved a classification in which he places all known irregularities in three great classes; of these there are divisions and subdivisions. Though at first it may seem to the student that this Angle classification is complex, it really is exceedingly simple. At the same time it is so important, being as it is the rock and foundation of all correct diagnosis, that I shall here take time to expound it to you, with the aid of the lantern. [The essayist here threw on the screen examples of each division and subdivision in the Angle classification.]

FORMS OF MALOCCLUSION NOT CLASSIFIED.

In addition to the three great classes there are two other forms of irregularity to which I will allude. As I have already pointed out in exhibiting the slides, in class I the mesio-distal relations of the molars are normal. In class II the lower molars are distal to normal, and in class III the lower molars are mesial to normal. In the subdivisions we have instances where the molars are normally related on one side and abnormally placed on the other. But cases have been noted where the lower molar may be distal to normal on one side and mesial to normal on the other. Such a case, of course, falls outside of the Angle classification. Nevertheless, a knowledge of that classification, with the habit of utilizing it as a basis of diagnosis, quickly determines for the orthodontist the line of treatment to be followed. Observing that on one side the molar is distally related, he sees that it must be moved mesially into normal occlusion; on the other side he finds the molar mesially placed, and it therefore must be carried distally; and, studying both sides, he sees that the movement of the lower arch must be all in one direction, around its arc. This movement is accomplished by using intermaxillary elastics, placed reversely on the two sides.

The other rare abnormality of which I shall speak is that occasionally alluded to as "double protrusion." I have unfortunately had four such cases in my practice, all coming within the conditions of class I of Angle. Indeed, I should find it difficult to even imagine a double protrusion of either class II or class III. And this is exactly why these awful cases are so difficult—a statement which brings me to a momentary consideration of so-called protrusions. A protruding upper jaw, in a class I case, is generally accompanied by wide spaces between the teeth, and, the molar relations being correct, the treatment is usually simple, demanding merely the reduction of the prominent teeth into a proper arch. Occasionally a class I case may have a narrowed vault and a protrusion of the anterior teeth; here, again, the protrusion may be corrected by moving the upper teeth into proper arch alignment. In both cases the lower jaw may be utilized as anchorage for intermaxillary force

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while reducing the upper protrusion. If, however, there be an anterior protrusion of the lower arch also, the utilization of intermaxillary force would not be so simple. Indeed, it has been asked, How may we use intermaxillary elastics to force the upper jaw backward, coincidently with similar use of similar force to move the lower jaw backward? At first glance the proposition seems ridiculous; yet I believe that intermaxillary force may be advantageously utilized in double protrusion—though this is not a fit time to discuss it. The point at which I am aiming is that the protrusion of both jaws places a case in an entirely different category from protrusions, or so-called protrusions, of one jaw.

In class II cases the apparent protrusion of the upper is largely magnified by the retrusion, or lack of development, of the mandible. A study of the profile shows that the fault lies largely in the false position of the chin and lower lip. Properly treated, at the proper age, very little reduction of the so-called protrusion is needed, provided the lower can be moved to true relations. The same is true of class III cases, the seeming lower protrusion disappearing with the development and forward movement of the upper arch and lip. In both instances the profile is suffering from a lack of development and consequent lack of balance, as I shall show with slides later. Moreover—and please bear this fact in mind—it is the undeveloped part rather than the seemingly over-developed part that mars the profile.

EXTRACTION INDICATED IN DOUBLE PROTRUSION?

With the double protrusion exactly the reverse is true; the features are marred by the over-development of both arches. And at this point I wish to introduce an argument for the future careful consideration of orthodontists. In class II and class III cases true balance may be established, in the vast majority of cases, without extracting any teeth; indeed, it would be hard to properly correct such cases after extraction. The exceptions are so few that they fall into the list of true deformities, or monstrosities, rather than mere abnormalities. In such cases, also, there is invariably a departure from type in the profile. How is it with the double protrusion? I have pointed out that the single protrusion—if I may be pardoned for using such a term—is mainly due to lack of development of one jaw, while the double protrusion is an over-development of both jaws. Again, the single protrusion is a departure from the type for the profile. In regard to double protrusion, I believe that a close study of such faces would show that the double protrusion is often an approach to type rather than a departure—that it is an atavistic throw-back of ancestral origin. This is important if true. For example, should we find a double protrusion accompanied by proportionate narrowing of both arches, the face being likewise narrow, we should be entirely right in attempting a restoration of normal arch width and shape—thus reducing the protrusions and restoring facial balance—without extraction of teeth. If, however, we should meet a case with normal arch form and relations, nevertheless showing marked double protrusion, with the face normally wide, what interference to undertake would be a grave question. Such a condition is a normal type, and is counted a deformity only because it is rare and therefore different from the faces about us. Rather

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than disturb such a normal occlusion it might be excusable to extract teeth in order to reduce the protrusions, though it should be remembered that such treatment would never change such a face to a normal type. Fortunately such cases are extremely uncommon, and for all practical purposes may be placed within the list of deformities and monstrosities —where, and where only, is extraction excusable.

ETIOLOGY AS A FACTOR OF TREATMENT.

The modern orthodontist likewise makes a study of the causes which produce or invite irregularities of the teeth. It may be truly said that etiology has always been considered, but never until within recent years has it so materially influenced modes of procedure. For example, I cannot here go deeply into the question of the causation of cases of class II and class III, but I may say that since we have concluded that these apparent protrusions are really in a large measure ocular delusions, and that the patients are in fact suffering from a lack of development of either the upper or the lower arch, we have come to see the necessity for earlier intervention. Referring back to the earlier part of this paper, I remind you of the mother who visited her dentist when her child's teeth began to erupt "crooked." Today she would be advised that immediate intervention is imperative. Indeed an arrest of development can often be distinguished prior to the loss of any of the deciduous teeth, and slight forces exerted at such periods will so invigorate the parts that development may be resumed, complete growth may result, and a perfect denture may erupt where, without interference, a quite extensive abnormality would surely have supervened.

Much has been said and written about adenoids as a cause of irregularities. The common argument is that nasal obstructions—whether from adenoids or deflected septa, hypertrophied turbinates, or polyps—compel mouth-breathing, which in turn molds the arches to become narrower than normal. It appears to me that the most important relation of nasal obstructions to irregularities has not received sufficient attention: However much mouth-breathing may affect the shape of the arches—and this has yet to be demonstrated with anything like exactness—I believe that the more important fact is that from improper breathing the child receives a disproportionate share of oxygen, and that from a lack of this element nutrition is impaired. When it is remembered that the alveolar processes are subsidiary bones, and that they are produced only as needed, we can readily conceive that a poorly nourished child may not be physically able to build bone as rapidly as the erupting teeth demand. Hence we have teeth erupting into arches which never grew, rather than arches which have been narrowed. However this may be, the modern orthodontist recognizes now the need of a more thorough comprehension of the etiology in order to cope to the best advantage with the abnormalities that abound.

SUMMARY.

To sum up, I would state that the *purposes* of the modern orthodontist are—First: To recognize the advent of dental abnormalities as early as possible, that treatment may be to a large degree pre-

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ventive. Second: In the presence of a lack of development of the jaws, to stimulate growth along normal lines. Third: To so move all the teeth of both jaws that normal occlusion may be restored. And the modern orthodontist believes that the nearer he comes to normal occlusion, the more certainly will he achieve the best possible facial results, and likewise the best arrangement of the teeth looking toward their prophylactic preservation.

In the title of my paper I also allude to the *accomplishments* of the modern orthodontist. In connection with this phase of my topic I have the pleasure of presenting to you a number of lantern slides showing the work of various men in all parts of the country. The point is that whereas in the past a few men with their systems have achieved fine results, such results were nevertheless confined to a very limited number. Since the advent of the Angle method of diagnosis based upon a classification, however, an increasing number of specialists are accomplishing similarly fine results —all working along similar lines with simple apparatus.

[The essayist then showed on the screen cases from the practices of various orthodontists, including three cases, one of each class, from his own practice. In all, the treatment of twenty-eight cases was illustrated, by means of over one hundred lantern slides.]

Discussion.

Dr. W. O. Talbot, New Orleans, La. I wish to express my appreciation of the splendid lecture just delivered in your hearing. Modern orthodontia has been clearly defined without going into detail as to the various methods of practice. The principles underlying the science itself have been presented to you in a crystallized form. Its purposes have been condensed into (1) Early treatment, which includes treatment of the deciduous teeth; (2) stimulation to normal growth, and (3) establishing normal occlusion.

The accomplishments of modern orthodontia have been too clearly illustrated by the pictures on the screen and by the orthodontia exhibit now displayed in the adjoining room to require any discussion on my part. They are simply proof positive of what has been and is being done. You have seen these beautiful pictures. Let me insist that all who are interested in this subject examine carefully the orthodontia exhibit tomorrow.

I do not differ with the essayist on the essential points that go to make up the purposes of orthodontia, but I do entertain different ideas about the etiology of contracted and narrow upper arches in class II and of the receding mandible in their relation to mouth-breathing, and of double protrusion. I understand from

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the essayist that contracted upper arches are due principally to lack of development, owing to the fact that the child does not breathe normally. The act of breathing through the mouth is at first voluntary, and if persisted in would have some influence in shaping the arch, on account of the muscular pressure from without, but to my mind the principal cause is the fact that the tongue fails to support the roof of the mouth. We know that the tongue is the organ that has much to do with the formation of the lower arch, and that it also influences the formation of the upper arch.

The principal cause of the receding chin or retruding jaw in class II is to my mind the constant pressure on the lower jaw of the muscles which open the mouth and hold the jaw in a receding position. We know that a child forced to breathe through the mouth keeps the mouth open, we might say, ninety per cent. of the time, and the muscles being held contracted for that portion of the time prevents the normal forward development of the body of the jaw, and the muscles themselves do not develop normally. Another influence that acts as a check-rein on the jaw is the stylo-maxillary ligament, which holds the jaw in check. Now, if we hold back the muscles at an early age it prevents the normal development of the ligament, and when we attempt to move it forward it is necessary to stretch that ligament until it attains sufficient length to allow the jaw to close normally.

The new classification—or the new class—mentioned by the essayist, of "double protrusion," is something which to my mind it is rather hard to classify or to ascertain its real cause. It does seem to me that a reasonable explanation of this condition is that since the teeth are formed at an early age, they are usually formed in proportion to the osseous development of the child. After the teeth are formed, if the osseous growth of the child is checked to a great extent, and the teeth erupt at the proper time, there would not be room in the arches to accommodate the teeth and it would result in a set of teeth larger in proportion to the size of the mandible. If under these conditions there is no nasal obstruction, and the tongue is strong and exerts its normal influence, the teeth will be kept in good arch alignment. There will be a lip prominence and a protrusion of the teeth as compared with the bones of the face. If in these cases there is nasal obstruction and mouth-breathing during the period of eruption of the permanent teeth, there will be a crowding and bunching of the teeth and the arches will be too small to accommodate them—but there will be no "double protrusion." I have seen a few of these cases, but never a "double protrusion" in a grown person.

Another of the purposes of modern orthodontia is the solution of some of these complicated problems, and an aid to their solution would be through the education of the entire dental profession; and while I believe in specialists in orthodontia and in several other lines, in centers of population, the young man who now receives his diploma to practice dentistry should know the fundamental principles of orthodontia and be able to classify any case of irregularity in order to teach the parents of the child the necessity of early treatment. Because if these cases are untouched until the parent notices the deformity that results from malocclusion, they will require a greater degree of attention and

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more time, and then we do not get the results that we would by the early treatment.

I wish particularly to indorse that part of the paper setting forth the influence which systematizing the work has had upon the growth of orthodontia. I believe system has done more than any one thing in the advancement of this modern science.

Dr. HENRY C. FERRIS, Brooklyn, N.Y. I am in hearty sympathy with Dr. Ottolengui's statements in reference to Dr. Angle and his course, as I am a graduate of his school. Until I received his instructions, I knew nothing upon the subject.

In order to have a classification we must have a principle upon which to build, and that first principle in the Angle classification is this statement: "That the superior first molar seldom, if ever, drifts forward of its normal position according to type."

There are cases where the first molar appears to be tilted forward of the normal position, and these are the cases that confuse the orthodontist in the matter of classification and diagnosis. That subject was brought up before the Angle school this last year and considerable argument ensued. The teaching of the school was that this molar should be tipped back to its normal perpendicular position before the class of malocclusion could be established.

Dr. OTTOLENGUI. That would only happen in extraction cases.

Dr. FERRIS. Where there was a mutilation, of course, this is what would occur. Now, in this classification Dr. Ottolengui mentions the class where there is a mesial condition on one side and a distal condition on the other. I think if that were really so, cases of that type could be classed by Dr. Angle's method if the molar were set up in its perpendicular position. The essayist did not present such a case either in model or picture, so it is very difficult to thoroughly understand what he means.

There was one other vital point that attracted my attention, and that was the return of the type to its original condition. The essayist's argument in reference to the double protrusion type can be illustrated to some degree in the lower animals, but if we mix the mulatto with his prognathism, and the Caucasian with the perpendicular relation of his teeth, we find the result to be a mesocephalic type and in normal occlusion. If I understand the essayist correctly, he would assume that in a later period of this type, its offspring might retrograde to the type of the mulatto, but such a case I have never seen. Some of you Southern gentlemen have doubtless seen the mixing of these races, and the result in the occlusion of their children. We all know that that is proof that nature readjusts the type according to the parental characteristics. It would seem rather queer that the offspring of such a combination should have the prognathism of one and the small jaw of the other.

Dr. OTTOLENGUI. Did you understand me to say that it would?

Dr. FERRIS. I am discussing the paper at a disadvantage. It is a subject that requires considerable study, and the essayist, after giving his paper, has shown a lantern exhibit that would do credit to a whole evening, and then asks me to go back and pick up the scientific thoughts in the paper—a very difficult task. These two points I have mentioned, however, I would like to elab-

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orate upon if I had the time, because I think that they are worthy of scientific consideration.

Dr. J. A. GORMAN, New Orleans, La. There is one point touched upon by Dr. Ottolengui which I consider to be of the greatest importance, and that is the simplicity of the appliance. With regard to the etiology of double protrusion it occurred to me that the habit of tongue-sucking would be one of the great causes of that condition. In tongue-sucking the tip of the tongue rests between the teeth, causing a constant pressure, and when the tongue is elevated contraction of the lower as well as the upper arch will eventually result. I think along that line, if we would study the habits of children more as we pass along the streets, we would learn a great deal with regard to the etiology of malocclusion. There is another habit which to my mind is a powerful factor among the causes of malocclusion, and that is the custom which some mothers follow of allowing their babies to use rubber pacifiers.

Dr. H. E. KELSEY, Baltimore, Md. The thought which Dr. Ottolengui brings out regarding what he terms double protrusion I think is original, as evidenced by the interest which we all seem to take in it. And it is a thought well worth our consideration, whether it has a place in the well-known Angle classification or not. The suggestion by one of the speakers that it may be referred to the cross between the colored race and the white race is not complimentary to some of the cases we see, in which we do not believe there has been any cross at all; and yet I do believe that where such a cross occurs it would almost invariably produce a double protrusion, as that is a marked characteristic of the colored race.

Dr. FERRIS. I did not mean to say that that was the cause of every case of this kind—I simply used that as an illustration.

Dr. KELSEY. I did not mean to imply that Dr. Ferris said that all cases of double protrusion were the result of such a crossing between the races.

Dr. Talbot mentions the point of the probable normal relation of the developing denture to the other bony structures of the body at an early age, and the subsequent interference in development after the size of the teeth has been determined. It seems reasonable to suppose that where this did not produce a malocclusion it would result in double protrusion, and I have a patient whose history seems to verify this theory.

Dr. OTTOLENGUI (closing the discussion). Since the gentlemen seem so much interested in the subject of double protrusion, as I only mentioned it in a suggestive way in the paper, I would like to add a few words on that line. I did not mean at all to add to the Angle classification. There was a time when, in looking over the literature of the subject, I thought the Angle classification might be amplified, but I do not think so now. I think it is absolutely efficient and sufficient. I wanted to point out the fact that protrusions come within the Angle classification in all cases where the deformity is largely dependent upon the fact that one of the jaws is too small. But I ask those who in the future may meet cases of double protrusion to examine them closely, in order to determine whether they are deformities, abnormalities, or whether they are typical —really normal occlusions. There are races that have these protruding front teeth, and I may be in grievous error,

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but I think they are not confined to the black race.

Now, gentlemen, I do not like to go into print with anything that may seem critical of any race, but I want to say this. When I first came to New York I was associated with a man whose practice was largely made up of the servant-girl class—mainly Irish. I noted many protrusions of both jaws, to the extent that the lips could not cover the gum tissue. Now, the Irish is by no means a black race, and I can readily see how they might marry white people in this country—

Dr. CRAWFORD. An Irishman would never marry a negro.

Dr. OTTOLENGUI. No, certainly not. What I am trying to get at is that there may be a *white* race with protruding jaws, and individuals with protruding jaws which may be traced back to some distant ancestor. I do not mean that a person may inherit the large teeth of one ancestor and the small jaws of another. I agree with Dr. Ferris that nature, in every cross, attempts to make a perfect human being according to some type. I do know this: That in breeding lower animals certain characteristics may be brought out for a few generations, and the new type may be constant for even several generations, when suddenly among the progeny there will appear one who will be of the original ancestral type. Therefore I ask you, when you come to treat double protrusion, to try to discover by a close study of the features before you treat the case, whether it is a normal occlusion and a normal human type, or whether you are dealing with contracted arches, which have caused that protrusion.

I would like to speak of one prominent case of double protrusion which I had some years ago which was distinctly an abnormality. It was a case where the upper and lower teeth were prominent, with spaces between. The correction of the case required simply the reduction of the two arches without extraction. Another abnormality where you may have double protrusion is where there is a saddle-shaped or a V-shaped arch, the arch being narrowed in the region of the bicuspids and protruding anteriorly. It is conceivable that if both jaws are widened to their normal width, those arches can be reduced to the normal length without extraction, but what I ask you to look for, and what I have been criticized for extracting to correct, is a case of normal width, normally shaped arches, and still a double protrusion. And I say if you choose and deem it wise you may reduce that conspicuousness by extraction, but you need never expect to make that a normal type of face, because it is a normal type when it comes to you.

Dr. FERRIS. In case that you dared to do such a piece of work, do you think that you could improve the type of face and create an harmonious result? Could you improve upon nature's plan of harmony in the type? Do you think it possible?

Dr. OTTOLENGUI. Standards of beauty vary with climate. What is considered beautiful in one country, what is exceedingly fine and normal in that country, may be looked upon as an exceedingly abnormal type in another country. There are black races that have an abnormal development of certain portions of the body; that being admired, they breed for that style of shape. I can imagine a country where prominent jaws are admired, but that is not the case in this

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country, consequently if you ask me if I can improve that condition, I would say yes, according to the Anglo-Saxon type or standard of beauty, but I could not make a normal occlusion of the jaws without all the teeth that God put in them.

The meeting then adjourned until Thursday afternoon at 2.30 o'clock.

FOURTH SESSION—Thursday Afternoon.

The convention was called to order Thursday afternoon, September 12th, by the president, Dr. Turner.

The first order of business was a clinical demonstration of the "cast inlay," embracing "Cast Gold Inlays, Bridges, and Plates," by Dr. Wm. H. Taggart. Chicago, Ill. (See opposite page.)

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Clinical Demonstration of the Cast Gold Inlay:

Cast Gold Inlays, Bridges, and Plates.

By WILLIAM H. TAGGART, D.D.S., Chicago, Ill.

Mr. President, ladies and gentlemen:—It gives me great pleasure to be here this afternoon, and I have unusual pleasure because of the fact that a father always likes to show off his own child. On a number of occasions in the past six or eight months before different societies I have described the method of casting gold inlays. The first demonstration of this system was given before the New York Odontological Society at its January meeting of this year (see *Cosmos* for November 1907, vol. xlix, page 1117), at which time four hundred and fifty members were present. The next demonstration was at the Chicago Dental Society, before an audience of seven hundred and fifty dentists.

I come before you this evening with a proposition which I feel is a true one, and one that I have been working at for nine years. I worked by the old methods of making inlays and I found that the only advance we were making year after year was in the direction of increased ability in technique; we were becoming more skilled in the manipulation of gold, and consequently gold inlays were gradually improving, but that the work itself did not improve, and it did not seem to me that beyond a certain point of increased skill there would be any change for the better unless we adopted some new ways of doing the work, owing to the limitations of what could be done with gold solder and plate. It occurred to me that it would be a good idea to prepare a filling of the cavity in wax, and finishing just as you would want

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the inlay to fit in regard to contour surface and contact. Then the question arose as to how to reproduce that wax in gold. I tried any number of methods, and I have twelve or fifteen historic appliances in my office which tell of the different steps in the development of this process. After experimenting with the simple gravity method, I felt assured that it would not answer the purpose, that it really required more exactness than we could get from any quantity of gold going into a mold, by virtue of its own weight. It then occurred to me to devise some way by which this could be done under pressure. Now, we have all felt and said to ourselves, after a man has been experimenting along a certain line, when the time comes for him to present this method, "That is just what I have been thinking of." I felt that exactness is required in every method, and consequently I began to devise this instrument [illustrating]. From the very start I had results that I never dreamed could be obtained, and throughout my different experiments I had to keep wide awake all the time to avoid doing one thing before another. Take the melting of the gold. It was a hard problem to accomplish successfully the melting of the gold, the sealing of the flask, and the forcing of the gold into the impression. Trying to do all these things at one time and with the haste and speed necessary, my results were often disastrous. I remember one time, when I had what I thought a fairly good piece of work ready, that in trying to cast it I blew ten dollars' worth of gold around my office, so that today I can go over the shelves and ledges and scrape off little fine particles of gold. It was spread very thoroughly all over the office, but of course none of it into the cast.

Before proceeding with the different steps I will pass among you several models showing the development of the process. A great many of the samples are the original ones, and lack the perfection of the present inlays, but I have not discarded them because I was asked by the members of the New York Odontological Society to donate them to the museum of the society. These specimens I greatly value and for that reason I will pass them around, having the assurance from the committee that they will be taken care of.

[Dr. Taggart then passed the original specimens around.]

Now I will describe the technique of the work. When working in the mouth there is no need to make any attempt to treat the cavity by smearing it with vaselin or anything else; the natural moisture of the mouth will be all the lubricant necessary to keep the wax from adhering to the cavity; and remember that the cavity must be free from undercuts. There is somthing about this process which makes it possible to obtain a much better attachment of the inlays to the tooth-surface than by the burnishing method. I do not mean absolutely that, but in making a burnished filling you sometimes have to cut off a corner or make further extensions of some sulcus of the tooth to carry out the idea of extension for prevention in that direction, and it makes the cavity so complicated that the burnishing method becomes almost impossible of execution, because of the difficulty of adapting the matrix to the cavity. Now, with this process you need have no fear of such a complication, it being as easy to deal with large cavities as with small and simple ones, because the complications of a large cavity help to hold the wax in position

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while carving. So I feel as though these fillings stay in the cavities better than any other filling that can be cemented to place. One other reason is the absolute contact with every part of the cavity, and if there is any one part of the inlay that fits better than another it is the internal part, because there is no opportunity of disturbing it.

Out of the mouth, when making inlays on extracted teeth the cavity should be smeared with vaselin, soapy water, or anything that will keep the wax from sticking. I prefer to take a rather generous-sized piece of wax, for the reason that if you take a small piece and push it into the cavity, holes are pushed into the wax, and saliva flowing through these will prevent any additions from sticking to the original piece. Now, the surface of the wax has to be free from imperfections, and with the aid of the flame a polished surface with no crevices is secured. It is then put into the mouth and the patient instructed to bite into it. Then after you see that all the teeth are touching, tell the patient to chew on the filling, while you go into the laboratory, for there are very few people who are able to chew naturally while they are being looked at. All this is for the purpose of getting a correct occlusion and articulation of the teeth.

By the way, I wish if there are any present who do not understand every step, or if I am going too fast, or taking it for granted that you know the facts because I do, do not hesitate to ask any questions you wish, because the very question you may ask may be one that someone else wishes answered.

Dr. Cochran. Is it possible by this method to cast backings on teeth?

Dr. Taggart. It can be done so far as the casting is concerned, yet it almost invariably results in checks in the porcelain if subjected to such a high temperature, and by casting the backing and cementing it on afterward you get rid of all danger of cracking the porcelain.

Now, after the patient has chewed on the wax filling as stated in order to get rid of any high points, the wax is lifted out of the cavity in order to ascertain whether it can be easily unseated, that there are not points at which the wax will drag, and that all the margins are leashed. The wax is now replaced in the mouth, and the approximal edges, buccal and lingual, are carved. Then the grinding surface is carved, and after this is done the patient should hold the jaws together while the outer surface is carved. Now that all the excess has been trimmed away, the wax is taken out of the mouth and chilled in water, so as to enable you to carve it readily. It is now brought back into the cavity, and with a piece of cotton saturated with vaselin rub the surface of the wax, and you will very soon get a polish almost equal to that made with a flame. The approximal surfaces can be finished by means of a tape carrying a little vaselin, and in that way we obtain the inlay smooth and polished. The inlay in wax is now taken out of the mouth and chilled thoroughly either with ice-water or ordinary hydrant water, and the little sprue wire now being placed in position, you will be able to handle it readily. At this stage you can oftentimes see little overhanging edges on the filling that are not necessary and may be trimmed off. It is now attached to what is known as the lid of the flask—which also forms the crucible—and is ready for the investment material.

In the investing, the first essential is a clean plaster cup for mixing the in-

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vesting material, and if there is any one feature more important than another it is this. After you have added the water to the material and stirred it, you will notice that there are a certain number of air-bubbles in it. To overcome this condition you must jar and work the plaster around in the cup, working the latter on the side until you smear the whole inside, allowing the bubbles to escape from the investment material, and finally you get an exceedingly smooth mass free from air-bubbles.

A MEMBER. What investing material do you use?

Dr. TAGGART. A special investing material. Now, holding the wax impression in my hand, I smear a little of the investment material on the cavity side of the inlay. When its surface is once covered do not push the material over the inlay but add more of the investment material. After the inlay is covered the rest of the investing material should be added on in such a way as not to disturb the first layers. The material is carefully built up to the crucible portion of the flask, the outside ring of which is now placed over the investment and the ring is filled. Of course that is up to date the best method I have for the flasking process, but somebody may work out in the future something that will suit us better.

A MEMBER. How long do you allow the investment to stand before heating it to melt out the wax?

Dr. TAGGART. Five or ten minutes. I do not think you get the full advantage of this method by hurrying.

Many dentists seem to think that this process will afford them a chance to use scrap gold. I would not advise that, because it is one that should not be prostituted by doing it in a cheap way—that is, by using an old crown from the mouth of some other patient, because I find that in Chicago, at least, gold of ten, twelve, and fourteen karats is sold to dentists to make crowns of. But in case you do use impure gold, I have a process of refining it while you are preparing it for the casting. The instrument is accompanied by a nitrous-oxid outfit—the nitrous oxid to be mixed with city illuminating gas. That flame melts the gold quickly, and at the same time burns out the zinc and copper that may be in it, bringing the gold up to twenty-two or twenty-three karat—depending on how long it is boiled—and by sprinkling the surface with borax and saltpeter you can see the fumes pass off very rapidly in the boiling process.

I will now explain the growth of the instrument to its present state of perfection. The first difficulty I met with was how to close the end of the flask while holding the blowpipe, and then to turn in the pressure to mold the gold at one time. Trying to do these three things at once caused me considerable difficulty, so I devised a way of throwing off the blowpipe automatically. I then found it difficult to melt the button of gold in the crucible end of the flask without excessively heating the latter. After experimenting with the nitrous-oxid flame I found that it would melt the gold so rapidly in the crucible that it would not have time to excessively heat the flask and disintegrate the investing material on the inside, and so I found at this point a real necessity for the nitrous oxid. Then I found it quite as necessary to seal the flask air-tight automatically, and I made the attachment to seal the flask and turn out the blowpipe automatically. When the instrument was first devised the source of

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the pressure was compressed air, but after the New York trip I conceived the idea that since I was using the nitrous oxid gas I could just as well utilize it to obtain the pressure which must be exerted on the molten gold, and so nitrous oxid furnishes both the heat and the pressure.

Now, a word about the melting of the gold. It is not advisable to put small pieces of gold into the crucible, because it will melt in small particles, and a portion will run into the sprue-hole and interfere with the gold entering the flask. The gold should be in the form of a button, and should boil in the crucible before it is forced into the flask.

A MEMBER. How many pounds' pressure do you use?

Dr. TAGGART. About fifteen pounds' pressure. With my first experiments I used from twenty-five to thirty pounds, but I found after the instrument was perfected it required much less.

A MEMBER. How much do you heat the flask to melt the wax out?

Dr. TAGGART. Heat it just enough to burn out the wax. When it is sufficiently heated, the wax will burn with a bright flame at the sprue-hole, and as soon as it has ceased to burn you can proceed with the work.

A MEMBER. How long does it take to make a cast filling after the preparation of the cavity?

Dr. TAGGART. That depends entirely on the dentist.

A MEMBER. What acid was that you threw the inlay in when you took it out of the flask?

Dr. TAGGART. Excessive heat makes the investment material cling to the casting, but by dipping the inlay in hydrofluoric acid for a few minutes all the investing material will be removed.

A MEMBER. Can this work be done with a gasoline flame?

Dr. TAGGART. I am working now on an instrument to be used with such a flame. The inlay is disked and polished to remove any little defect that may have existed in the wax. It is then fitted in the cavity and removed, and the grinding surfaces and the marginal edges are finished out of the mouth by disking and polishing until the margins are well defined.

Dr. YOUNG. What moral effect will this method of making inlays have on the profession? Will it not do for operative dentistry what rubber has done for prosthetic dentistry?

Dr. TAGGART. I hardly think so. It will not limit art in any way at all, for you must remember that when working in gold you still have to be artistic, and it cannot be done in a haphazard manner.

Dr. OTTOLENGUI. I have a very skilful young lady assistant in my office, and she has done all the porcelain inlay work in my office for years, but when I found that she could make one of these gold inlays I raised her salary.

Dr. TAGGART. I can take the most unskilled dentist in this audience, and after a half-hour's instruction he will make a better gold inlay than the best dentist here could ever make before. Then I can take the best dentist in the house, and he will do work that he has never dreamed of.

There is one element of inlay work over which we have all stumbled in the past, and that is in the accurate fitting of the inlay. This process makes it possible for the poorest dentist to make an accurate fit, but the contouring and carving of the wax model requires artistic ability.

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Discussion.

Dr. J. H. Lorenz, Atlanta, Ga. In all my experience from the day I left college, I have never inserted a cohesive or non-cohesive gold filling. I am an inlay enthusiast. The more inlay work I do the more I become convinced that it is the proper method of filling teeth, and the farther I get from cohesive work.

I have used inlays in every position in the mouth, in simple, compound, and complex cavities. I have used them as abutments for bridges and anchorages for plates, and so far as I know they are giving perfect satisfaction. The first inlays I inserted are doing well today. Some may say that my failures go to the other dentist. That may be true in a few instances, but patients in my part of the country are too eager to return and tell you of work that has failed.

You all probably know the method of making gold inlays by burnishing the matrix and filling it with solder. This procedure I have demonstrated at every National and Southern Branch meeting since the International Dental Congress held in St. Louis. I have found from experience that cast inlays are more satisfactory when made of 22-k. gold than when cast in pure gold, because during mastication the inlays of pure gold are hammered down, and by opening the interproximal space make the patient feel as though something were wedged in between the teeth.

As Dr. Van Woert rightly said, inlay work is a protected cement filling. This is purely and simply what it is, and it is the only method in my mind for restoring lost tooth-structure. It has been said time and again that the fluids of the mouth will dissolve the cement between the inlay and the teeth, and cause a failure. Practically no cement remains in the filling, and what little does is protected by the perfect margin of a properly made filling. If this kind of work fail it is not the fault of the principle, but of the operator. The method Dr. Taggart has presented to us today will enable us to do better and more accurate work, and shorten the operation considerably. As, for example, where a loose second molar can be retained by locking it to the first molar. By the old method, separate inlays for each tooth must be made. They are then removed in an impression and attached by means of a small bit of solder, which requires two sittings. With Dr. Taggart's method, all this can be done in one sitting.

Gentlemen, the possibilities of Dr. Taggart's discovery are only in their infancy. I consider it one of the greatest discoveries of the twentieth century, which in my estimation will place Dr. Taggart on one of the highest pinnacles in the dental profession.

Dr. L. E. Custer, Dayton, Ohio. When I was a boy my mother would take a barrel of cider and a barrel of apples and properly proportioning them, would boil them in a big copper kettle from early morning until late at night. The result of that day's labor, now and then adding fuel or perhaps adding a fresh cup of cider to prevent its boiling over, was finally a few gallons of thick but delicious apple butter. The final product of that day's work and vigilance was

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but a cupful, as compared with that begun with in the morning. The longer the boiling and sputtering was kept up, the less there was to show for it, but the residue as it decreased in volume was sweetened in flavor. It takes time to make apple butter.

When the novice looks at a complicated piece of machinery made up of hundreds of pieces—wheels, levers, cams, and springs—he stands musing to himself, What a wonder its inventor must have been! When the real genius, however, sees this same machine, sees what its purpose is, and what a complication of parts has been used to accomplish that purpose, he begins to simplify. He throws out a wheel here and a lever there, and finally, after days of study and application, he brings forth a machine simple in its action and free from complication—so simple that its author blushes as you ask him if that is all there is to it. The longer he worked, the more time and study he gave it, the simpler it became. He began with a barrel of apples and a barrel of cider; he boiled and he boiled, but he finally hands you a product much less in volume and bulk, but containing the essence of it all. It takes time to make apple butter.

We as dentists are often like the novice; we wonder at a complicated device and compliment its author, and pass by as unworthy of comment many appliances because of their simplicity. Let us not forget that complication is not an indication of study or of genius, but rather the opposite. The simpler the process or the device, the greater is the genius who studied it out. The novice gives you cider and apples and plenty of them; the genius and student gives you the sweet thick apple butter.

Today the dental profession is witnessing the culmination in one of its branches of just such an example. Recognizing the value of the metal inlay we have been shifting about in all directions for the best and easiest method of getting a perfect matrix; then the best method of filling that matrix with metal without change of shape or form. We have resorted to all sorts of schemes, and the most of us have been fooling around with a wagonload of apples and cider—a wagonload of wheels, ratchets, and springs; a wagonload of matrices and investments. In the meantime, however, one man has been quietly boiling down a single kettle of cider; he has thrown out wheels and he has discarded the matrix. In one act he models the filling in wax as you would have it in gold; in the next act he melts and casts the gold so perfectly to the mold that the micrometer detects no change of form or shape.

All this is so simple and yet so perfect now that we marvel at its simplicity, and while we do so, we must also acknowledge that nothing but genius and hard labor has achieved this result. I have no doubt that every step in the perfecting and simplifying of this process was fraught with failures and disappointments, and only a person of genius and perseverance could have brought it to so simple and perfect an ending. Its author in this one act alone has erected for himself a monument and a name as enduring as the profession which he has so greatly benefited—Dr. W. H. Taggart.

Dr. R. C. Young, Anniston, Ala. When I left my home in Alabama to come to this meeting, my heart leaped with joy, because I was coming here to see this beautiful, this wonderful demon-

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stration of Dr. Taggart's. I shall return with feelings of joy mixed with sorrow. Joy because it will lighten my labors, joy because it will make my work less trying to my patients; but with sorrow because the profession must lose that great skill that made the glorious Webb, the genial Wedelstaedt, and others who have been made famous through the mallet.

This process is seemingly so simple that I fear it will have the same moral effect upon operative dentistry that the Goodyear product has had upon prosthetic dentistry. I thank Dr. Taggart deeply for this method, and for this demonstration, for my patients and for mankind.

Dr. T. P. HINMAN, Atlanta, Ga. I feel as if I should say to Dr. Young, "Be still, sad heart, and cease repining; Beyond the clouds the sun is shining." I have been doing this work for sixty days and know a little about it. I made a special trip to Chicago to see Dr. Taggart work, and have been doing it myself quite a little, and while it looks simple, like many simple things, it is hard. It takes considerable skill to make these wax models in the mouth; in fact requires just the same amount of skill to prepare the cavity accurately on correct principles for an inlay as it does to make the same cavity for any cohesive filling.

I want to thank Dr. Taggart for suggesting something that is not going to degrade dentistry. Whoever heard of working in gold and making things cheaper? Working in gold makes things cost more, and I get more for a cast filling than for a cohesive-gold filling, because I know that I have done for my patient a better and a more permanent operation. It requires skill and a delicate touch in the mouth to prepare the cavity perfectly; takes just the same judgment as in preparing approximal cavities for cohesive gold.

Dr. J. D. PATTERSON, Kansas City, Mo. I would like to say a word upon this subject out of compliment to Dr. Taggart, if nothing more, and to say how much I have been delighted with his presentation.

It occurs to me that some of our friends are taking a peculiar view of what the cast inlay will do for dentistry, when they intimate that there will be something degrading in the result; that it will take from dentistry something of the demand for the artistic. I cannot for the life of me see it in that light. It takes hard work off your shoulders, off your mind, off your eyes; it takes away the shock to the patient of malleting a gold filling in a tooth, and that is all; the artistic and esthetic remain; and who can deny that it gives the artist a double chance in the reproduction of natural contours and forms in the wax to be reproduced in gold. There also remains the consideration of all points regarding the formation of cavities, and the pathology of prevention of the recurrence of disease. For the life of me I cannot see where any desired function of the dentist is curtailed. Instead it is increased.

Dr. R. OTTOLENGUI, New York city. Since the question has arisen as to what this casting method is going to do in operative dentistry, I am going to tell you how it seems to me. Bonwill first taught us the value of occlusion in the articulation of artificial teeth, and the orthodontists are teaching us the value of occlusion in every line of work. No one admires Webb and his disciples more than I—and by the way, a man who

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stood shoulder to shoulder with Webb, who worked by him, is with us today, Dr. Parmly Brown, who did the same kind of work and knows that what I say is true. But while these men did these wonderful restorations, when it comes to the bicuspid and molar region how many men ever gave us the artistic occlusal surfaces that we get now with this cast-inlay process? How many, gentlemen? And yet we are told today that the art element is to be lost. Why, gentlemen, the artistic in gold fillings is achieved for the first time in the history of dentistry. What does that artistic achievement mean? Does it mean simply the forming of the wax which is to be molded? It means a knowledge of tooth-forms; it means that we must have the proper manipulative skill; that we must teach students the difference between the second and the third molar; or the right and left side of the upper and lower jaws, and unless we have this knowledge and skill there will not be that ability to do these things with our artistic casting in gold.

And I tell you what I told Dr. Taggart when I first saw the machine. I said, "Dr. Taggart, the greatest achievement of your machine is its very weakness; the accuracy with which it reproduces a form will limit the work to the skill of the man who makes it." In the making of that cast gold inlay, the ability of the man will show in the result. Gentlemen, that which you see here and admire as the achievement of the machine, is not the achievement of the machine. What you really admire is the perfection of form, and that was put there by Dr. Taggart, the artist. Now he gives us a machine with which we can do the same thing, provided we can make the wax inlay, and I do not understand that he can teach a tiro to do this in half an hour, but that you must put dental knowledge into that wax form, and then, being careful with that wax form, in putting it into the investment, you can teach your laboratory assistant in an hour, or two hours, to complete the work. That is taking the drudgery from your shoulders, but leaving the knowledge and art in your own hands. And, gentlemen, it means one thing more. It means that painless dentistry is in sight for the first time. When we can do this kind of work for the patient in two short sittings of a half-hour each, and make a restoration which would formerly have taken the most skilled operator possibly an hour or two hours, you are giving the patient a beautiful painless operation to take the place of the slovenly amalgam operation. As Dr. Hinman said, any gold operation, any gold proposition is not a cheap proposition.

Dr. E. Parmly Brown, New York. I have been thinking on this question a great deal, and agree with Dr. Patterson and Dr. Ottolengui in saying that this work that we have seen today will bring dentistry higher and higher; but what I want to impress upon you particularly is that it does not matter whether the work will last ten, twenty, or thirty years. All kinds of fillings last from one minute to one thousand years. Some of the fillings that you gentlemen have put in will be in the teeth for a thousand years from now, if the teeth have not disintegrated. It is a question of advancement in our profession. I have taken a little part in trying to put a damper on some of the radical departures that have been introduced in our profession, but today I am not here to decry anything, but

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to put on record my opinion that this gold inlay work, as well as porcelain inlay work, has a place in dentistry that will stand forever, just so long as the human race lives.

We need not all expect these beautiful results that we see produced by Dr. Taggart. We have all tried to make gold fillings, and most of us have failed at times, and must not expect that this machine will do all for us; we want to have something besides this outfit of Dr. Taggart's. We want porcelain in the front of the mouth every day in the week, including Sunday. Do not put gold where it will be in sight in any lady's mouth. If you do, be sure to make an apology when you do it, no matter under what conditions it was placed there. You want to use amalgam as we have always done, but should use the same skill in that as Dr. Taggart uses in his methods. You have to have not only gold, tin, and silver, but you have to have a tremendous percentage of brains in the right place, and you will have success with amalgam. We have to use a large amount of cements, and Ascher's cements are the best we have today for use where in sight; gold work, however, in the posterior teeth—the bicuspids and molars—in order to have the requisite durability in mastication.

You need to know how to do all this work, but to do so you must know how to manipulate porcelain in all of its phases. But, gentlemen, you will have to put in contour gold fillings just so long as you live, so let us take that broad view of dentistry that covers the whole field.

Dr. TAGGART (closing the discussion). I will not detain you longer by saying anything more in regard to this subject. All I wish to say is to thank you for having so kindly received it, and for having been so careful in what you said in order not to hurt my feelings. Dr. Brown I have admired for the last thirty years, and the remarks he has made touch me deeply. I see that he is a man of sufficient artistic sense to appreciate that this has a field in dentistry. I agree with what he says in regard to placing gold in the front of the mouth. In all my desire to work out this process, and with all my natural eagerness to apply it, I have never been tempted for one second to get away from porcelain in the front of the mouth. But my experience with porcelain work in the back teeth has been that it has proved disastrous in the majority of cases; consequently, I felt that as long as this work had to be done, there was no better way to do it than along this line.

Report of the Orthodontia Committee.

October 8, 1907.

To the Organization Committee of the Jamestown Dental Convention:

As chairman of the Committee on Orthodontia Exhibits I beg to submit the following report:

During the past year the committee devoted its efforts to securing such a list of contributors to the exhibit as would make it both interesting and instructive, and we feel safe in saying that the interest manifested in it, together with the list of well-known names of those contributing is sufficient evidence that it was a successful and interesting feature of the convention.

Those contributing to the exhibit were—

The American Society of Orthodontists, whose beautiful collection of 160 pairs of models, illustrating the results obtained in the treatment of a large number of cases by many eminent orthodontists, whose names do not appear in the list, and which were all made from plaster impressions and constructed after the method of the Angle School

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of Orthodontia, was loaned to the convention.

Dr. Calvin S. Case, who exhibited a series of eight glass cases in which were mounted casts of both the face and dental arches, illustrating in the most comprehensive manner the results of the treatment of a variety of dento-facial deformities, including open- and close-bite cases and mesio-distal malocclusions.

Dr. V. H. Jackson, who exhibited a hundred models illustrating results obtained by the use of his system. They were beautifully mounted and often represented the appliances in position on the teeth so that the observer might study the method of treatment and the result obtained.

Dr. Martin Dewey, whose contribution was exhibited with the collection of the American Society of Orthodontists, and demonstrated very clearly, by a series of impressions and casts with attached descriptions, the technique of model-making as followed in the Angle School of Orthodontia.

Drs. S. G. Dodson, Burt Abell, O. W. White, and A. H. Ketcham, who exhibited a well-selected collection of models illustrating malocclusions of the temporary teeth and their treatment.

Respectfully submitted,

HARRY E. KELSEY, *Chairman.*

The report was adopted and ordered printed in the Transactions.

Resolutions on Army and Navy Dental Corps.

Dr. BURTON LEE THORPE. I wish to present the following resolutions offered by Dr. Ottolengui, which have been approved and recommended by the Organization Committee:

Whereas, The need and advantages of dentists in the army having been fully demonstrated by the present Army Dental Corps; therefore be it

RESOLVED, By the Jamestown Dental Convention—a convention having a membership representation from all of the states in the Union—that the time has now arrived for full recognition by Congress of the dental profession; and be it

RESOLVED, That Congress at its coming session be urged to pass an act creating a regular officered dental corps as permanent additions to both the army and the navy; and be it further

RESOLVED, That these resolutions be printed in all the dental journals and furnished to the Associated Press.

Motion was made and carried that the resolutions be adopted.

From the Odontological Section R.S.M., Eng.

Dr. CAMPBELL, secretary of the Organization Committee, then read the following communication from the Odontological Section of the Royal Society of Medicine, London, Eng.:

ODONTOLOGICAL SECTION,
ROYAL SOCIETY OF MEDICINE,
20 HANOVER SQUARE, W., LONDON,
August 12, 1907.

Dear Sir,—Your kind invitation to the members of the Odontological Society of Great Britain, which came through Dr. Beadles, has been handed to me by Mr. Mummery, our president.

The Odontological Society is now known as the Odontological Section of the Royal Society of Medicine, and in the name of that section I write to thank you for your cordial invitation, and to send fraternal greetings and best wishes for a successful meeting from our members.

I fear, however, it will not be possible for any of our members to attend your dental convention. as it comes just after the holiday period.

Believe me,

Yours faithfully,

J. LEWIS PAYNE,
Hon. Sec'y Dental Section R. S. M.

General Resolution of Thanks.

Dr. THORPE then presented a resolution of thanks to the following: Dr. W. H. Trueman, Dental Historical Exhibit; Dr. Wm. Bebb, Exhibit of Comparative

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Anatomy; Dr. H. E. Kelsey, Exhibit of Orthodontia; Dr. Richard Grady, Dental Navy Exhibit; Dr. C. J. Grieves, Clinic Committee; Dr. F. W. Stiff, Membership Committee; Dr. I. B. Smith, Registration Committee; Dr. J. W. Manning, Exhibit Committee; Dr. W. H. Haller, Committee on Clinic Material; Dr. W. H. Ewald, Entertainment Committee; Dr. E. G. Lee, Arrangements Committee; Dr. J. L. Walker, Committee on Transportation to the Virginia State Dental Association for entertainment; to the Southern Branch of the National Dental Association; to the press of Norfolk, and to all the dental journals who have exploited this meeting; to The S. S. White Dental Mfg. Co. and to Dr. R. I. Pearson for the convention souvenir; to Dr. C. L. Bane; Hon. Harry St. George Tucker; Mr. R. H. Sexton, Chief of Department of Congresses; to the foreign delegates; to all others, committeemen, clinicians, essayists, and exhibitors, who have made this meeting possible.

Motion was made and carried that the resolution of thanks be adopted.

There being no further business before the meeting, the president, Dr. V. E. Turner, declared the Jamestown Dental Convention adjourned *sine die.*

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THE CLINICS.

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THE CLINICS.

Dr. W. H. Colgrove, Johnstown, N. Y. "Gutta-Percha Filling with Cavity Lining."

This clinic consisted of filling a cavity on the buccal surface of a lower third molar with gutta-percha, using a cavity lining. The cavity was first lined with the cavity lining. The gutta-percha was then inserted, after having heated it directly over the spirit lamp. The clinician claims this to be the best method of heating the gutta-percha after one has become accustomed to the method. A cavity in a third molar is difficult to fill with gutta-percha, but by the aid of the cavity lining the operation is rendered comparatively simple.

Two other cavities were filled with the same material for the same patient, one being on the grinding surface of the third molar, the other on the distal surface of an upper right canine.

Dr. Levi C. Taylor, Hartford, Conn. "The Junior Phase of the Hygienic Filling, Specially Adapted to Small Cavities in the Teeth of Children Eight or Ten Years of Age."

Remove the decay from the cavity, and without further preparation, insert a little good cement, and then prick to the bottom of the cavity a piece of well-annealed gold with a sharp round-pointed instrument. Turn the edges to the center and press in with a hot burnisher; wait two minutes, and finish lightly with carborundum strips.

Dr. Wm. Finn, Cedar Rapids, Iowa. "Gold Fillings."

Dr. Finn inserted two gold fillings, one in the mesio-occlusal surface of an upper first molar, the other in the disto-occlusal surface of an upper second bicuspid, following the method of Dr. G. V. Black, using non-cohesive gold cylinders in the gingival third of the cavity and finishing with cohesive gold. The hand mallet, in the hands of a lady assistant, was used throughout the operation.

The filling made in the molar was brought into contact with the first bicuspid, the second bicuspid having been extracted some years previous, and the space having closed about one-half.

Dr. J. W. S. Gallagher, Winona, Minn. "Gold Filling: Combination Method — Cohesive and Non-cohesive Gold." (Cavity on the mesio-occlusal surface of an upper right first molar.) The clinic demonstrated—

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(1) Application of rubber dam.

(2) Preparation of the cavity—instrumentation, extension for prevention, etc.

(3) The placing of non-cohesive gold cylinders: The placing of No. ¼ cylinder (quarter-sheet of soft foil No. 4, folded and rolled to form a cylinder) in the linguo-gingivo-axial angle; a No. ¼ cylinder in the bucco-gingivo-axial angle, and one No. ¾ cylinder between these to act as a wedge. This gold was forced to place with a rather large plugger point, using hand pressure and mallet in the hands of an assistant. The cohesive gold was then used, starting it from the occlusal step and building down to the soft foil, along the axial wall, and locking it into place, care being taken to properly step the plugger and to use the correct angle force, Wedelstaedt plugger No. 1 being used for condensing the cohesive gold.

(4) Finishing of filling: Showing the use of Black's saw, trimmers, files, etc., to bring the filling to proper contour and form.

Dr. J. W. S. Gallagher, Winona, Minn. "Gold Filling." (Operation similar to the one preceding. Cavity on the mesio-occlusal surface of an upper right first molar, rather wide linguo-buccally, using two No. ¼ cylinders and two No. ½ cylinders of soft gold foil.)

Dr. L. C. Elkins, St. Augustine, Fla. "Amalgam Inlays and Tin-Lined Amalgam Fillings."

I have never been satisfied with the results obtained by using amalgam as a filling in the ordinary way, but have realized that with all of its defects, it is a factor that cannot be eliminated from the ordinary dental practice. In my efforts to obtain better results with this material, it occurred to me some five or six years ago to try it as an inlay, using tin foil as a matrix, the tin being protected, of course, against the action of the mercury; also to use it as a filling in a tin-lined cavity. In both methods the advantage of tin margins is obtained, and by the inlay method more satisfactory and artistic results in cases of badly broken-down molars where large restorations are necessary.

The following brief description will make my method clear to any inlay worker, as its technique as applied to preparation of cavities, manner of obtaining and removing the matrix, etc., is practically the same as for gold inlays, and hardly needs to be touched upon:

Prepare the cavity as for a gold inlay, and burnish No. 60 tin foil into the cavity until it is perfectly adapted—I frequently use a double thickness of foil, varnishing one side with gum mastic dissolved in chloroform, folding it upon itself, bringing the varnished surfaces together; the tin is so soft that you can easily burnish the double thickness, and the varnish between gives additional protection against the action of the mercury. Then soften a piece of modeling composition, press it into the cavity, chill thoroughly, and remove—the matrix will come away with the composition. Run a plaster model, which, when the composition is softened and removed, gives a model of the cavity with the matrix in position.

In many cases it is advisable to get an articulating model by allowing the patient to bite into the composition after it has been pressed into the cavity. The matrix is now placed in position on the

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model, and the matrix varnished thoroughly with the gum mastic solution and allowed to become almost dry, having it just a little sticky so that the amalgam will adhere. Mix the amalgam as for an ordinary filling, avoiding an excess of mercury; fill, and build out to contour. After the amalgam has hardened, polish, remove from the plaster model, and set with cement as one would a gold inlay. The varnish is used simply to protect the tin from the action of the mercury, and is not depended upon for a firm union between the tin and amalgam. The retention grooves which are cut through the tin and into the amalgam will prevent these materials from separating when the inlay is cemented in the cavity. In badly broken-down teeth, pins can be used for anchorage, making a very strong and serviceable filling. When pins are used, allow the free ends to extend into the cavity as much as possible, so as to make a strong union with the amalgam. In large inlays artistic results can be obtained by carving the cusps while the amalgam is soft, and finishing when hard with burs, disk, and a brush wheel. In some cavities, where it would involve the loss of too much sound tooth-structure to prepare for an inlay, prepare the cavity as for a filling and burnish the tin into the cavity, carrying it into the undercuts; varnish, and fill as one would any amalgam filling. Finish with disk, cutting from the filling toward the margins. By this method one can obtain a filling which is almost as easy to insert as an ordinary filling, together with what is almost impossible to obtain in an ordinary amalgam filling, viz, perfect margins, which are the main essentials to the perfect preservation of the tooth.

Setting aside the idea of any chemical action of the tin as a preservative of tooth-structure, we know that we have in it a material that is capable of the most perfect mechanical adaptation. In using tin in connection with amalgam in this manner, we get the best properties of both materials, viz, the plastic qualities of the amalgam and consequent ease of manipulation, while the tin gives us perfect margins. This work for the last few years has given me a great deal of satisfaction and fills a place, at least in my practice, that nothing else can.

The specimens which I present for your consideration were most of them made nearly five years ago, and are some of those upon which I conducted my experiments. They have been handled a great deal and dropped numbers of times, but you will note that there is no apparent spheroidal tendency or drawing away from the margins. The work was done with little or no thought as to cavity preparation, my interest at the time being directed to some method of working the tin and amalgam in combination, and to find some means to protect the tin from the action of the mercury. After experimenting with a number of substances, I found that gum mastic, dissolved in chloroform and used at about the consistence of the sandarac varnish that we get from the dealers, produced the most satisfactory results.

Case I [exhibiting] shows the method in detail—(1) The matrix burnished into the cavity; (2) the matrix drawn out in the composition; (3) the matrix on plaster model, varnished and ready for filling, and (4) the finished inlay. (A post should have been used in this case.)

Case II is a large inlay in which posts

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are used, showing the matrix and posts in position on the plaster model ready for filling, and the finished inlay.

Case III is a tin-lined amalgam filling. An overlap of tin is left at the cervical margin in order to better show the tin lining.

Nos. II, IV, V, and VI are cases where large restorations are necessary, and to which amalgam inlays are particularly adapted.

A gold inlay in many such instances could not be used on account of expense. You do not wish to use a crown for this or for other reasons, and amalgam fillings in these cases are not altogether satisfactory. Here the amalgam inlay is indicated, and solves the difficulty.

Case VII shows models of a practical case.

Dr. H. L. Ambler, Cleveland, Ohio. "Cohesive Tin Foil."

Dr. Ambler showed that with his cohesive tin foil a filling in any cavity in any tooth could be made one solid mass from base to surface, so that if the filling were removed by breaking the tooth it could be put on an anvil and partly forged out without breaking in pieces.

After partly filling a cavity, he burnished the surface, then built on more tin foil so firmly that it could not be prized off. This foil is more tenacious, more cohesive, and makes harder fillings than any similar foil. It is used extensively for technique work in dental colleges in the place of cohesive gold foil, because it teaches the use of tin and cohesive gold at the same time, as the tin is manipulated with the same instruments and the hand mallet used for cohesive gold foil.

Dr. C. M. Ryan, Syracuse, N. Y. "Artificial Enamel Filling."

Where crowns are not indicated, I believe we can bring about a more natural appearance by restoration with artificial enamel than with any other material at our command. The constituents resemble the natural tooth-structure. I do not use this material on molars, but do sometimes on approximal cavities in bicuspids. There is no secret in working this material. The powder should be slowly incorporated with the liquid until the mass will start to roll after the spatula, when it is at the proper consistence for using. An important part of the operation is to press the material very firmly against the walls of the cavity, using only bone or ivory instruments and vaselin. Final pressure is obtained by the use of celluloid strips, which if used carefully will finish the filling, giving a natural polish. Three colors are sufficient for matching any tooth—Nos. 1, 7, and 8.

Dr. J. Q. Byram, Indianapolis, Ind. "Porcelain Inlay."

The inlay was for a mesio-incisal cavity in the upper right lateral, the cavity being prepared with a flat seat and with the labial and lingual walls forming obtuse angles to the pulpal wall. These walls were prepared with a hoe excavator. A platinum matrix was used, and the inlay was constructed of Brewster's high-fusing porcelain. The foundation was constructed of No. 2, and the enamels used were gingival, C, middle, Q, incisal, U, with A as a glaze. The color was fair and the adaptation good.

Dr. Byram also showed a method of imitating white spots in teeth. After the

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foundation and the sections of the inlay were constructed, the whole pigment was applied in the desired location and fused. Then a glaze was placed over the entire mass. The white reflects through the glaze and gives a natural appearance.

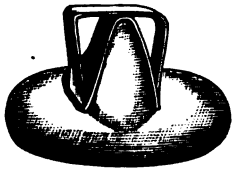
Dr. F. T. VAN WOERT, Brooklyn, N. Y. "Taking Impressions, Making Amalgam Dies, and Fusing Porcelain."

Dr. A. M. JACKSON, Macon, Ga. "Short Cuts with Gold Inlays: Contour and Occlusion Obtained with Cast Fillings Without Waxing or Investing."

FIG. 1.

After securing a good matrix, thicken it with 22-k. gold solder. Then cut a strip of 22-k. or 24-k. gold plate one-sixteenth of an inch wide, and tack the

FIG. 2.



end of the cervical margin of the matrix by re-flowing the solder. Place the matrix in position on the tooth, and with pliers bend the strip of gold to conform to the outline of the area with which the filling should come in contact. Burnish the margins of the matrix and remove it from the tooth. The result thus obtained is shown in Fig. 1.

To protect the matrix and to facilitate handling, a bit of investment material is used, as shown in Fig. 2.

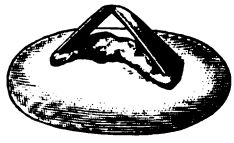
The next step is the flowing of the 20-k. solder between the matrix and the

FIG. 3.

outline band until the desired result is obtained, as shown in Fig. 3. One side of the inlay shown at Fig. 3 has been polished, but the other side is shown just as the soldering was completed, to show how the solder will cling to the outline strip.

Fig. 4 shows a single contour with the strip in position ready for the

FIG. 4.



soldering. This little strip of gold may be used to contour or raise the cusps of bicuspids or molars by means of cast fillings. A piece of iron wire, secured into the investment material at one end, is of great value as a means of handling during the final soldering.

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Dr. J. H. Lorenz, Atlanta, Ga. "A Detailed Construction of Gold Inlays and Hood Abutments."

Dr. Emerson R. Sausser, Philadelphia, Pa. "A Practical Method of Obtaining Platinum and Gold Matrices for Porcelain Inlays."

This clinic consisted of a practical, systematic, and thorough method of burnishing platinum and gold matrices with the use of a special set of burnishers, seven in number. Each instrument has its special purpose, and by using them in order, a matrix can be thoroughly burnished to place, the result showing no spring or wrinkles, but a marginal condition much thinner than the original gage of the matrix material, and consequently a reduced joint between the finished inlay and tooth.

The first two instruments are designed to use in cases where the cervical margin either approximates or extends under the free margin of the gum, indicating the passage of the matrix under the same to a point above the cervical margin of the cavity, a vital point too often slighted in this work. The instrument consists of a blade having a concave face, with serrations thereon, the shoulders of which are pointed upward toward the knife-edge end of the instruments, giving a grip on the forward stroke and a release on the withdrawal of the instrument. The rest of the set are burnishers, especially designed to reach every part of the coronal surface of a tooth.

After the matrix has been passed under the gum, the first instrument on the list is used—one to thoroughly burnish the labial surface and margin from cervix to tip; next a mate to this instrument, which covers the lingual margin and surface, and then two flat-sided burnishers with well-rounded edges, to cover the two points one is so apt to slight, namely, the cervico-labial and the cervico-palatal angles. The cervical portion is next carefully burnished to place, and with our last instrument gum camphor is forced into the same. Wet linen tape is next passed over the parts, and with heavy burnishing over the matrix the operation is completed.

The following advantageous features are claimed for these instruments: (1) Ease of passing the matrix under the gum; (2) design of the instruments, allowing fearless burnishing, resulting in a reduced condition of the matrix at the margin; (3) specialization of instruments, each covering a special portion of the field of operation, suggesting systematic work, and (4) confidence, speed, and thoroughness.

Dr. I. B. Howell, Paducah, Ky. "Ascher's Artificial Enamel." (Cavities in the upper first bicuspid and upper lateral.)

In the preparation of the cavities ample undercuts and square margins must be obtained. The cavities are dried with alcohol and hot air, being careful to remove all foreign substances. Having all the instruments and material perfectly clean and ready for instant use, the enamel is thoroughly mixed with an ivory spatula to the consistence of moldine, care being taken not to knead the enamel with the fingers. It is then inserted with an inverted-cone agate instrument, pressed well against the sides of the cavity, making the filling very full, and sealing the margins perfectly. After

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allowing the material to slightly harden, it is condensed as much as possible with instruments coated with yellow vaselin, the surplus being worked toward the margin with constant pressure. The filling is then contoured while hardening, and is polished with celluloid strips coated with vaselin, afterward being cleansed with alcohol and dry cotton and kept dry for fifteen or twenty minutes. The result is a filling of the same shade as the natural tooth, apparently as good as any baked porcelain inlay.

Dr. H. H. Street, Baltimore, Md. "Restoring the Contour of the Anterior Teeth by Using Gold Inlays Faced with Artificial Enamel."

The cavity is prepared in the same manner as for a gold inlay. After the matrix has been adapted, stiffen the floor and lingual margin with solder to prevent any change in the form of the matrix, being careful not to allow any solder to flow on the labial margin of the matrix. Use wax to obtain the contour, allowing the material to fill the cavity two-thirds full lingually, leaving a space labially about the thickness of the labial enamel, or a little more. Place a piece of 24-k. gold, about No. 40 gage, around the wax from the cervical to the incisal margin, extending it over the incisal edge to the margin of the cavity. Invest, boil out the wax, and solder from the lingual surface. Trim off the portion of the matrix which extends over the labial margin. With very little finishing the inlay is ready to be cemented into the cavity. Not having allowed the wax to extend to the labial surface, the investment fills this space, preventing the solder from flowing on the labial surface of the gold, and giving a gold inlay with a box in the labial surface, which is filled with the enamel in the same manner as any other cavity where it is used. If the enamel will do what we hope, and what the manufacturers claim for it, the result will be a very beautiful and durable filling, having all the advantages of the gold inlay without any of the gold showing on the labial surface.

Dr. D. H. Baldwin, Peoria, Ill. "Porcelain Inlay."

Special stress was laid on the cavity preparation, so as to obtain as much mechanical support as possible, thereby lessening the dependence upon cementation. A matrix of 1/1000 platinum was burnished into the cavity and baked three times, using Brewster's high-fusing porcelain. The inlay is etched with hydrofluoric acid and cemented to place with Harvard inlay cement, using silk tape with vaselin to press to place.

Cavity preparation, color, and restoration showed a very artistic piece of finished work.

Dr. C. Edson Abbott, Franklin, Mass.

This clinic consisted of plaster models of incisors with various typical cavities. As the margin is the weak portion of a porcelain inlay, it seems logical to form the cavities so that all the exposed margins are of rounded outline, avoiding all angles and staircase forms, which are easily broken off under stress. The shorter the perimeter, the less margin there is to be a source of danger.

The inlays made for these prepared cavities further illustrated the carrying out of the principles of (1) a square

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base at right angles to the direction of stress, (2) of a large body of porcelain within the cavity, to increase the effect of the retention by grooves and etching, and (3) the making use of porcelain in bulk for strength.

Further than this, where the margins of the porcelain inlay are exposed to the contact of the opposing teeth, the essayist is accustomed in certain cases, by the use of a sandpaper disk previous to setting, to slightly round the margins of the completed inlay and the cavity at this line of contact. Where this slight groove would show from the front of the incisal edges of the incisors, the cavity is prepared and the inlay made with a slight tongue of porcelain dipping between the enamel plates, so that the edge appears as an uninterrupted line.

This blunt margin method makes many inlays stand where otherwise failure would surely result from gradual fracture of enamel rods and porcelain.

Dr. Edwin J. Blass, Portage, Wis. "Ascher's Artificial Enamel."

The patient was a young man about twenty-five years of age, whose teeth had suffered badly from the ravages of caries.

The tooth selected as best suited for this filling material was the upper left central incisor. In it I found a cavity extending almost entirely across the labial surface of the tooth, and about two-thirds gingivo-incisally. Another cavity involved the disto-approximal surface of the same tooth. These I joined, making one very large cavity, quite deep but not involving the pulp.

After having the patient moisten the teeth I secured the proper shade of the artificial enamel and proceeded to apply the rubber dam. I found it necessary to use the cervical clamp, as the cavity extended up under the free margin of the gum. The same order of procedure was carried out in the cavity preparation as I would adopt were I to use gold instead of the enamel, with the exception of not beveling the enamel margins. Just as with the use of porcelain, if the operator bevels the margins, the thin film of filling material which will entirely surround the cavity is certain to chip off, the result being ruin instead of success.

With the cavity prepared and thoroughly dried, I proceeded to mix the enamel, first having the necessary instruments readily accessible, so as to cause no delay. Having poured a sufficient quantity of the powder on the slab, I thoroughly stirred the liquid and poured a few drops near the powder. With a stiff bone spatula I incorporated the powder into the liquid, not using much force but thoroughly kneading until the mass attained the consistence of putty. With everything in readiness I at once brought the material to the cavity, into which, with the use of a new and well-cleaned smooth burnisher, I forced the mass, using care that all undercuts and deeper parts were well filled. After the walls and floor of the cavity were filled I coated the filling material with vaselin, and burnished it carefully toward the enamel tooth-margins until I secured about the desired restoration. I now took a narrow fine sandpaper strip, thoroughly coated with vaselin, and inserted it between the centrals over the labial surface and down between the left central and lateral incisors. Drawing the strip back and forth carefully, I took off a slight excess of the filling material that occurred, besides securing a more perfect contour of distal

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and labial surfaces. I followed this by a vaselin-coated cuttlefish strip, thus making a smoother finish to the filling. After having removed all visible scratches I wiped off the vaselin and proceeded to the polishing.

The method is slightly different from that advised by the manufacturers, but I have followed this system for over a year, and get better results than by the use of agate instruments alone. I used very fine cuttlefish disks, and coated them by revolving them in a cake of paraffin. With the disks prepared in this way I secured quite a high polish, following this by burnishing with the agate points.

The filling now being completed, I noted the time, and found that from the insertion of the plastic mass into the cavity until the completion of the work I had consumed about thirty minutes. I now removed the rubber dam, cleansed the tooth, and allowed the patient to close the mouth. The result was a filling the same shade as the tooth, and in my estimation as esthetic in appearance as would be a porcelain inlay. With an experience of about two years in the use of this much-discussed filling material, I have had but few failures, and in these cases I found the cause in not having mixed the powder and liquid sufficiently thick.

I feel that this artificial enamel has supplied a long-felt want, especially for those who are so situated as not to be able to secure day electric power for a porcelain furnace. With conservatism used in its placing and great care in its manipulation, I have no hesitancy in declaring that Ascher's artificial enamel looks well, wears well, and will give entire satisfaction to both the operator and the patient.

Dr. T. C. Trigger, St. Thomas, Ont., Can. "The Insertion of a Gold Inlay in a Mesio-occlusal Cavity of a Bicuspid, and Methods Used for Retention."

The process of filling teeth by means of inlaying with gold, with the successful and permanent results obtained, is considered to be one of the best means of restoring tooth tissue. This is particularly true in the case of large compound cavities in bicuspids where there is extensive involvement of the enamel and dentin caused by caries, and an attempt to restore them by cohesive gold results many times in failure, owing to the frail enamel walls being unable to withstand the force of malleting the particles of gold, and also the possibility of the gold not becoming accurately adapted in the deeper portions of the cavity, thus making the gold plug defective, with an ultimate recurrence of decay. When those cavities are inlayed with gold it is inserted in one solid mass, and the intervention of cement between the inlay and cavity walls prevents the recurrence of decay.

The cavity that I have chosen for this clinic is a large mesio-occluding one in an upper right bicuspid.

In preparing a cavity to receive an inlay the utmost care should be taken. First cut away all overhanging edges of enamel with a fine enamel chisel, then the cavity is prepared as if for the reception of a cohesive gold filling, except that no undercuts should be made so that in the swaging of the matrix it will be prevented from going to these parts and thus prevent an easy removal. In preparing the cavity edges to receive the inlay, the buccal and lingual walls should be cut freely away so that, in swaging, the matrix can be easily applied to these parts and also admit of an easy insertion of the

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inlay. These edges should be cut as nearly perpendicular as possible to the axial line, and in no case should they come in contact with the enamel walls of the opposing tooth. This is a very essential point in the preparation of this part of the cavity edges, either in the direct or the indirect method of forming, as it is necessary to have sufficient space to take the impression of the cavity. In preparing the occlusal edges of the cavity they should be cut so as to allow of as much lateral support to the inlay as possible, and to further increase the retention of the inlay a dovetail extension is made in the direction of the central fossa, where the tooth tissue is so frequently found defective. To cut this dovetail extension a round or fissure bur may be used, of such a size that it will admit of the matrix being swaged and burnished easily into all its parts. (See Fig. 1.)

Fig. 1.

Cut the basal or gingival edge of the cavity in a rounded form, for if this wall be cut flat it will only complicate the difficulty of forcing the matrix into the angles formed in the preparation of the cavity edges. The marginal edges of the cavity should be cut straight, without any beveling. Avoid all sharp angles or short curvatures, as it will be impossible to force the matrix to these parts without tearing.

Finish the edges with fine finishing burs, small stone and polishing disks, after which it is ready for the reception of the matrix.

In such a deep cavity it is unnecessary to force the matrix to its full depth, which can be avoided by the insertion of a "core" at the base of the cavity and built up to the needed extent for this purpose; the adaptation of the matrix is thus accomplished much easier. Providing the dovetail extension on the occluding surface was not made to secure the inlay in place, this surface should be cut in a crescent form; the side walls of this surface of the cavity sufficiently providing, laterally, together with the security of the inlay in the cavity, for enough retention of the inlay to prevent its dislodgment.

I generally use pure gold for forming matrices, and I do so in this case as it is more adaptable than platinum.

The thickness of the gold to be used in a cavity to be inlayed will depend, of course, on its depth, and the extent to which the matrix metal is forced therein. For this case the thickness of gold used should be no greater than 2/1000 inch. The thickness is always a very essential point, as many operators in commencing this line of work are very liable to use the metal too thick, and thus endanger the easy and accurate adaptation of the matrix.. On account of the gold usually obtained from supply houses being too thick, it is very essential to have a good mill, so that the metal can be rolled to suit the case.

The gold should be rolled in convenient sized strips two inches long by one-half inch wide, and should not be annealed until required.

From this cut a piece of gold the required size to extend over the cavity and allow for swaging. The end of the piece of gold is now cut in a rounded form, and

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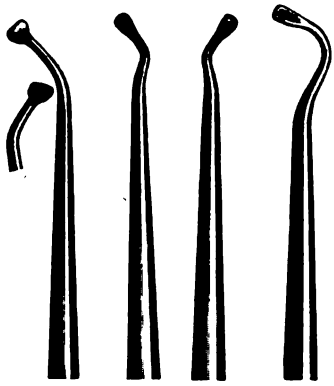
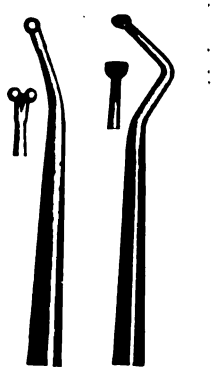
carried a short distance beyond the gingival border of the cavity. The matrix is then swaged approximately into the cavity, which is accomplished by the use of a matrix swager having two blades used in conjunction with rubber forms, which can be had at rubber supply houses. The matrix swager is made by J. W. Ivory, Philadelphia, an instrument manufacturer. By this means the matrix is forced into the cavity and at the edges enough to get the outline of the cavity. Now remove the matrix and trim it so that after being placed in the cavity it will extend about two lines over the edges, and thus prevent the matrix falling short from the border, and also prevent, in the soldering process, gold flowing beneath the marginal edges and thus making the inlay defective. Before reapplying the matrix to the cavity it should be annealed. This can be done by heating the gold to cherry-red heat; then by immediately plunging it into a solution of four parts sulfuric acid to one of water it will not only become very soft, but will be thoroughly cleansed. Very desirable results are obtained by using alcohol. If platinum be used, heat the metal in an electric furnace until a white heat is attained, and then allow it to gradually cool. To force the matrix in closer apposition to the cavity walls, use pellets of cotton, spunk, and unvulcanized rubber. To produce an absolute adaptation of the matrix it is very essential to use suitable burnishers, forcing the matrix in place by slight pressure rather than by burnishing, as the latter will cause the metal to become rigid and prevent an easy adaptation of the matrix.

Fig. 2.



1 7 8 9

Fig. 3.



11 12

For burnishing this case I shall select the instruments shown in Fig. 2. No. 7 is used to force the matrix to the floor of the cavity, while Nos. 8 and 9 are used on the buccal and lingual walls, and No. 1 to force the matrix into the dovetail extension made on the occluding surface. Sometimes it is advisable to remove the matrix and again anneal and then reburnish. In the majority of cases, in forming the matrix for gold inlays, I adapt the matrix to the cavity, as it is a much easier method and obviates the labor necessary for the taking of an impression and the forming of the cast.

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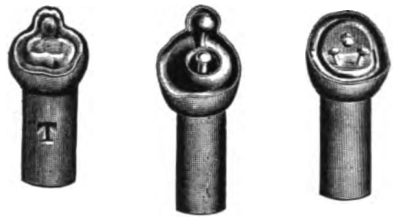
The utmost care should be taken with the marginal edges of the cavity. Nos. 11 and 12 (Fig. 3) are used, the latter being a flattened burnisher, very adaptable to the gingival edge, while the former, a double-ball instrument, runs astride the remaining marginal edge of the cavity.

After the burnishing operation is completed, it is ready to be removed from the cavity, either by teasing it from the cavity or use a fine-pointed instrument, allowing it to drop on the mouth mirror, which will act as a vehicle to keep it from becoming distorted. The matrix can also be removed by inserting a small amount of compound on an impression tray, and withdrawing the matrix in this manner. In this case, however, we will tease the matrix from the cavity.

Now take a stick of impression wax, such as is made by the Detroit Dental Mfg. Co. preferred, as it has good adhesive quality, which is very essential. I have suggested the wax made in stick form, as it will meet the requirements for inlay operations. Thoroughly heat the end of the wax over a Bunsen burner, and then invert the matrix, external surface downward, and force it gently into the wax until it reaches the edge of the metal. (Fig. 4.) Now the matrix is ready to form the retention. To do this, take a good-sized bur and cut a retention through the matrix into the compound beyond, according as the depth of the cavity will allow, care being taken not to cut too close to the marginal edge. Fig. 5 shows the retention made in the matrix. To increase this retention a platinum pin may be inserted in the center of the hollow retention in the wax, and extend beyond the matrix according to the depth of the cavity. (Fig. 5.)

If the hollow retention is not made in the inlay, pin or loop attachments may be used. Holes are drilled through the matrix, and pins are inserted therein and extend beyond, corresponding in depth to the core in the cavity. (Fig. 6.) Loops may be substituted for the pins.

Fig. 4. Fig. 5. Fig. 6.



After the retention has been made it is invested in plaster, care being taken to incorporate it thoroughly into the retentions made. The amount of plaster to be used for investment should not exceed in area that of a twenty-five-cent piece, as too much plaster will only endanger the soldering process. It will be found that by using plaster only after the casting operation, the investment detaches itself very easily, for if sand be incorporated with it the particles of sand become fused, and difficulty is experienced in removing it from the inlay.

After the plaster has become thoroughly set it is removed by immersing it in hot water; then carefully remove the impression wax from the matrix, thus exposing the matrix and the plaster core, which will form the retention to the inlay after the casting process.

Sometimes the matrix can be withdrawn from the cavity, directly invested, and then built up in the same way in the matrix, according to the depth of the cavity and the extent of contour made.

After the investment has been thoroughly dried, it is ready for the casting.

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Twenty-two karat solder is used. Cut it in small pieces, and place them on the matrix and around the plaster core, flow them over the surface, then add more until they are perfectly fused over the surface until it becomes of a glazed appearance. I usually use borax in small quantities and in the powdered form, the contour being carried out by adding more solder where this is required. Before placing the inlay in the tooth cut away all surplus solder, remove the core, and then cleanse with alcohol. Before applying the inlay to the cavity, remove the core and all the cement from the undercuts. Now fit the inlay in place to see if the proper contour has been made. In mixing the cement to set the inlay, it should be of a creamy consistence; the cement should be of the very best and as adhesive as possible, as the security of the inlay depends to a great extent on this material. Miniature spatulas, which are very convenient in applying the cement in the cavity and to the inlay, can be had from the Buffalo Dental Mfg. Co. Hold the inlay in place until it becomes thoroughly set, after which it is finished by using small stones, gold finishing burs, sandpaper disks, and then finally burnishing.

The construction of an inlay for this cavity could be done by the indirect method, by taking an impression and forming a cast therefrom, or casting the inlay by pressure. Notwithstanding that good results are obtained by these methods, still, in a great many cases, the technique of forming the matrix for making gold inlays, has proved so successful that it will always retain a place in the construction of gold inlays.

Chair clinic. Subject, recruit of U. S. army.

Dr. W. A. Capon, Philadelphia, Pa. "Carving as Applied to Porcelain Crowns."

The clinician showed a comparatively easy method of handling various porcelains of different fusing-points and the reduction of manipulation difficulties by using some combining substance such as corn starch, gum arabic, or tragacanth, the latter more preferable.

The clinician also showed the few carving instruments necessary and their simple form; shrinkage of porcelain at first and second baking, etc.

Dr. W. W. Wold, Jackson, Minn. "A New and Simple Removable Facing for Crown and Bridge Work."

By this method one can use any pin facing on the market and can make the backing with less than half the expense of the Steele, Brewster, or other ready-made backing now on sale at the supply houses. The technique is very simple.

First step: This is to punch the holes in the backing (36-gage platinum is preferred) just as you would for any ordinary backing.

Second step: Now cut a small strip of platinum, about one-sixteenth of an inch wide and one-half an inch long, and carefully wind it about the pins of the facing, thus forming a tube.

Third: The tube is now placed on the backing so as to cover the pin-holes, and soldered with a piece of pure gold.

Fourth: The platinum between the pin-holes of the backing is now cut out with a fissure bur.

Fifth: A small piece of platinum is now soldered over the end of the tube, forming a box for the pins.

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Sixth: The backing is placed on the facing and burnished, which completes the backing.

If for a Richmond crown, the backing, with the facing in position, is waxed to the band and pin on the root or plaster model, and the parts removed together. The facing is now taken from the backing and box and the backing painted with whiting and water. It is then invested and soldered.

If for an anterior dummy, it is not necessary to invest. When the tube is soldered on to the backing, take a piece of 22-karat gold plate, No. 30 gage, long enough to cover the box and extend to the cutting edge of the facing, and solder with 22-karat solder.

Place the facing in the backing and burnish the plate gold to the shape you wish the lingual surface to be.

Remove the facing and paint the inner surface of the box and the backing with whiting and water; then, holding it in a pair of tweezers, it is a very simple matter to fill in between the backing and the gold plate with 20-karat solder.

If the bite is close the pins must be bent for the six anterior teeth—this making the box shorter.

It is a good plan to bevel the facings on the cutting edge so that the backing will protect them. This is done before the backing is burnished to the facing.

The facings are finally cemented into place on the finished piece, and are very strong.

Dr. D. H. McNeill, Athens, Ga. "A Simple Method of Restoring a Broken Porcelain Facing."

First cut off the pins that are left in the broken crown, also grind off a small portion of the cutting edge, then with a No. 2 bur or a thin carborundum disk cut two parallel slits from the cutting edge of the crown to the old pins. By this means the new facing can be slipped into position, grinding it from the lingual surface until you have a perfect adaptation to the old backing. If the bite is very close, grind off a portion of the old crown from the lingual side, then place your new facing in position, holding it there with the left thumb until you have adapted a piece of pure gold No. 36 gage, about the size of the original backing, to the lingual side of the old crown, allowing the pins of the new facing to come through the gold. After you have burnished the gold from the lingual surface well around the pins, slip it off, being careful not to change its position; invest and tack the gold to the pins with a very small piece of solder; then replace on the old crown and reburnish until you have perfect adaptation, allowing the gold to come over the cutting edge of the facing. Again remove the facing, invest, and flow solder over the entire portion of the gold backing as you would a crown; then polish and set to the old crown with cement, and you will find that you have a neat, strong, and easy piece of work.

Dr. J. C. Hertz, Easton, Pa. "Banding Roots for Porcelain Crowns with New Trimmers and Facers."

The object of my method is to construct a crown with sufficient strength of band and porcelain to have no tendency to irritate the gingival margin and prevent the band and porcelain from causing unusual fulness at the labial margin; also eliminating the necessity of shading, or of adding to the facing at the

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labial margin—by allowing the facing to extend under it.

To secure these advantages the canal should not be enlarged toward the labial or buccal surface, in order to allow for the necessary reduction of the root for the ferrule and facing, which is seen in Figs. 1 and 3.

FIGS. 1–5.

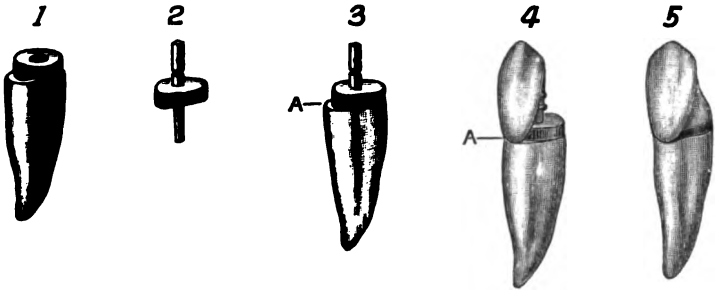
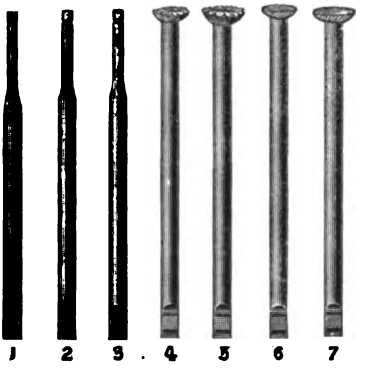


FIG. 6.



The line of the finished root should not be entirely with the gum line, but should be even labially, and be finished one-sixteenth of an inch above the palatal gum line, when the bite will allow it.

The trimmers and facers I have designed to facilitate this shaping are seven in number (Fig. 6). Nos. 1 to 3 are safe-sided, to cut the shoulder or depression at the labial portion only with a groove to indicate the depth to penetrate. They are used as a drill, held so that the thumb has support upon the adjacent teeth, but, after the first full cut, take only one-half the width of that first cut, which will guide and make it quite easy, and as you approach the side take No. 6 or No. 7 trimmer, or small square-end fissure bur to conform the angle. Nos. 4 and 5 are facers. Nos. 6 and 7 are safe-sided trimmers used to even the depression and slightly trim on the sides and palatal portion. The band of No. 28 iridio-platinum is conformed directly on the root, and then soldered. Pure platinum of No. 33 or No. 34 gage is used to complete the cap and allow ready adjustment of the pin, through a small puncture in the cap, which is secured with sticky-wax, then

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removed and soldered with platinum solder and replaced on the root. Any form of facing or crown, with or without pins, can be used, as I do not solder the pins of the tooth to the dowel. Fig. 4 shows the adjusted facing, Fig. 5 the finished crown.

This is made practicable by an investment used to secure the parts in their accurate position for the first biscuit, which is made by mixing to a thick batter two parts plaster and one part fine fire-clay. Place upon a depression made in this while soft a one-eighth inch thick paste of asbestos (water with fine asbestos); place the face of the crown on this, and cover with the plaster and fire-clay the metal parts and also the cutting edge.

Make the investment very small, to dry out readily and to enter a small oven; subject to slow heat, remove the wax and place the body on. Then biscuit, and afterward cool, remove from the investment, and finish as if soldered.

The asbestos paste is used to prevent the etching of the facing by contact with the plaster and fire-clay. The heat should not be carried higher than to a good biscuit, or the asbestos may affect the facing.

The different forms of facings and crowns, with the various ways in which they should be grooved between the pins to allow of setting the face sufficiently low on the post without regard to the pins, will occur to the practical hand, for the band, owing to its strength, being No. 28 gage, can be made narrow to adjust to a short root.

Dr. T. H. McClure, Chicago, Ill. "Some Advantages of All-Carved Porcelain Crowns for the Posterior Teeth."

Applying the inlay principle to crown work, one of the important features of this operation is the concave shaping of the root-end to allow for the greatest possible thickness of porcelain in the finished work. Studying this root-preparation closely it will be found that the crown is supported in such a way that a fracture of the root is hardly possible.

An all-carved porcelain crown is constructed on a 45-gage platinum base, the platinum being peeled off before setting. This brings the porcelain in close contact with the root, forming a joint which, if necessary to be carried very deep on account of a badly decayed or split root, will encourage a healthy gum and discourage lodgment of foreign matter. The accurate articulation and contact with adjoining teeth is another important feature of this operation. In upper bicuspids and molars two pins, No. 18 gage or less, are used, the protruding ends being carried into the canines or thickest part of the porcelain. The clinic showed the crowning of a bicuspid by this method without taking an impression, the fitting and shaping being done directly in the mouth.

Dr. D. H. Baldwin, Peoria, Ill. "Porcelain Shell Crowns."

The preparation is made with stones, and fissure and finishing burs. The impression is taken with modeling compound, using small cups for the purpose, making the model of either copper, amalgam, or cement. The matrix is made over the model, using 1/1000 platinum foil, the final burnishing being done in the mouth. Build up with porcelain, carve, and bake from two to four bakes to finish. Remove the matrix and cement the crown to place.

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Dr. EDWARD EGGLESTON, Richmond, Va. "A Modification in Bridge Work."

Dr. Eggleston demonstrated an original method of producing the dummies in the suspended section of bridges. The actual form of the natural teeth was produced by this method, and the contact of the dummy-ends with the natural gum was a complete and accurate reproduction of the necks of the teeth.

Dr. H. E. S. CHAYES, New York, N. Y. "Removable Bridge Work."

Dr. Chayes in this clinic demonstrated the use of the single bar, double lock attachment, consisting of a rectangular bar having a lock at each end placed parallel to one another, the space between them bucco-lingually equaling in distance the thickness of the bar. A hood snugly fitting over the bar covers all but the mesial ends. A split pin pierces the top of the hood and engages the distal lock of the bar, taking up the wear on the metal by spreading, in proportion to the room provided for it. A piece of No. 30 gage clasp plate is attached to the lingual surface of the hood, its anterior or mesial end terminating in a U-shaped spring, and engaging a corresponding U-shaped spring provided for it at the mesio-lingual end of the bar. After attaching the bucco-mesial end of the bar to the abutment, the dummies are attached to the hood. The piece is waxed up, the hood carrying the dummies is then removed, and the hollow portion of the hood is filled with a thin mix of plaster to prevent the ingress of rubber. The piece is flasked morsal side first, and the wax boiled out, after which it is packed and vulcanized. Before placing the work in the patient's mouth a thirty-second of an inch is filed off the top of the bar so that when the contrivance is in place, the top of the bar will not touch the top of the hood, which in the main fits snugly over it. Any pressure exerted upon the piece during the process of mastication will be taken up by the alveolar ridge.

The force used in mastication being a rotary one, and the two locks being placed on the horizontal bar and soldered perpendicularly to the abutment, the contrivance cannot be displaced during mastication. It can, however, be removed by exercising a slight pressure in an upward direction and perpendicularly to the horizontal plane of the bar. One or two dummies may be swung onto one or two abutments without in any way endangering the firmness of the latter, and if the whole has been carefully constructed the result will be satisfactory and lasting.

This lock solves the lower saddle-bridge problem, in that—

(1) It provides an attachment resisting attempts at lateral motion.

(2) It relieves the abutments of all strain, hence increasing their life and period of usefulness.

(3) It is a clean piece of work; the bar never touches the gum, and the saddle piece is easily removed and cleansed.

(4) The saddle may be added to at any time, thus enabling one to cope with the problem of absorption of the alveolar ridge.

(5) It places the hold, or the greater part of it, in the saddle piece, where it belongs, and not close to the distal end of the abutment.

(6) It provides an attachment which is practically indestructible.

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Dr. GUSTAVUS NORTH, Cedar Rapids, Iowa. "Replacing Porcelain Facings Without Removing the Bridge or Crown from the Mouth: Quick Method."

Where porcelain facings fail in bridge or crown work it is a difficult matter to remove the bridge or crown for repairing, especially where Richmond crowns are used for anchorage. The following method for repairing porcelain facings has proved very satisfactory, without removing the bridge or causing any discomfort to the patient.

Select a facing of proper size and shade to replace the broken one and drill holes through the gold backing for the pins of the new facing. Countersink the holes on both sides of the backing and cut the pins so that they are just a trifle longer than the thickness of the backing. Split the pins off the new facing with a thin ribbon saw half the distance of the thickness of the backing.

The facing is now ready to fasten in place by using a little medium-setting alloy. Place a little alloy on the side of the backing around the pin-holes that come next to the facing, and press the facing firmly into place, holding it there until the operation is completed. Take a hatchet-shaped instrument and spread the split pins firmly, then burnish alloy in around the pins on the surface of the backing. After the alloy has sufficiently hardened, grind the lingual surface down to the original form, and we have a very sightly and durable piece of work.

Amalgam has been used for repairing crowns and bridges for many years, but generally in a bungling and unskilful manner, but by the above method repairing can be made as neat and strong as new work.

Dr. RICHARD BLUM, New York, N. Y. "Gold Inlays as Abutments for Removable Bridge Work; Combination Teeth Used in Bridge Work; A New Way of Enveloping Dental X-Ray Films; Examining Box for Dental X-Ray Negatives."

Dr. Blum exhibited a removable bridge, composed of a saddle supported mesially by an upright piece of clasp metal fitting into a slit cut into a gold inlay, which was cemented into the anterior tooth. The distal attachment of the saddle is a Griswold spring fitted in a box soldered into a gold inlay and cemented into the posterior tooth. The teeth used on the bridge are S. S. White diatoric, which are cemented into boxes of pure gold soldered into the saddle.

An original device for examining dental X-ray negatives consists of an asbestos-lined wooden box—about 12 x 5 x 6 inches—the top of which is an opal glass plate. This glass top is painted black, leaving a bare space in the center about the size of the average dental radiograph. The box contains two incandescent globes to illuminate the oblong space, the globes being controlled by a rheostat outside of the box to govern the amount of light necessary to bring out a greater or lesser density of the film to be examined.

A new envelope for dental X-ray films consists of a sheet of black photographic paper immersed in a solution of rubber and carbon bisulfid, which forms an adhesive and waterproof coating. After wrapping the film in paper thus coated, lycopodium is sprinkled on the outside to remove stickiness. Being less bulky, the envelope is more readily adaptable in the mouth, and being thinner than the usual envelopes the negative is subject

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to less distortion, and is at the same time light and waterproof.

Dr. A. W. JARMAN, Philadelphia, Pa. (A) "Crown and Bridge Work, Fixed and Removable. (B) Crown and Bridge Work Without Solder."

This clinic consisted of a practical demonstration of removable bridge work, of four pieces of practical work in the mouth, and some work in the rough, to illustrate the making of crowns and bridges without solder. The advantages of removable bridge work are many, the principal of these being the hygienic feature. By the use of the saddle the lingual side is restored as well as the buccal, also the alveolar portion occupied by the gum, thus giving a more complete restoration than by the open form of bridge work. The use of split pins and telescope caps, solid cusps and contour was included in the demonstration.

The use of saddles, the main feature of the clinic, was demonstrated by work in use and not by models, as is often the case. The work is heavy, being made almost entirely of coin gold, thus producing that which will not bend or spring in the removing or in the stress of mastication. Porcelain is used for facings but in no instance is durability sacrificed for the sake of porcelain.

Dr. E. DEWITT R. GARDEN, Tarrytown, N. Y. "A New Facing for Bridge Work."

These facings are made from the best molds, the finest and strongest mineral being used in their composition.

They are convexed with a wedge-shaped groove, coming to a stop near the cutting edge. The advantages of the convexed back are: They do not need much grinding; they are good in case the bite is short, and they are easily adapted.

The backings are made of one piece, stamped to fit the groove, or they can be made by cutting a piece of orange-wood to fit the groove. A very thin piece of metal, either gold or silver, is bent over the orange stick and pressed into the groove until it comes to the stop; then press or burnish the metal over on the tooth, and trim the overhanging edge of the metal. When the facing is backed and ground, wax with hard wax into position on the model; carefully remove the facings and paint the metal with whiting, invest as in ordinary bridge work, and solder. It is not necessary to wait for it to cool off; throw it into water, take out, trim, polish, and cement the facings to their respective places.

The advantages are that the facings can be replaced without removing the entire bridge; there is no change in color from the time selected until finished, and there is no danger of cracking on account of heat.

Dr. W. R. RENALDS, Salem, Va. "Bridge Work Construction on Sanitary Principles."

I will as concisely as possible describe the construction of the two bridges which I here present for the inspection and criticism of the members of the convention.

First, I will describe the construction of the one on the left side of the model—the all-gold bridge. The abutments are prepared and crowned as in the usual method of bridge construction. After

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adjusting the crowns to the proper occlusion, wax up between the abutment crowns, and then use cusp buttons or diatoric teeth, or carve the occluding surface, as preferred, to a proper occlusion. Place strips of wax of sufficient length to reach from the anterior side of one abutment crown to the posterior of the other, by heating one edge of the wax strips and pushing them against the crowns and the dummy section, exposing the grinding surface to the depth of the cusps. Form a plaster matrix by placing the plaster on the exposed grinding surface and the wax flanges and building up to the desired thickness. When the plaster has hardened, remove the matrix and trim to fit the molding ring, line the matrix with tin foil, and for the die pour fusible metal as cold as permissible. Re-line the die with tin foil, pour the counter-die with the same care as to the temperature of the metal, and the result will be a smooth die and counter-die. Swage the grinding surface piece, clean in an acid bath, and fill with 22-k. solder by investing the cusp portion of the piece and allowing the investing material to extend far enough in each end not to interfere with the adjustment to the crowns. Bevel under the edges of the piece, readjust to occlusion, and wax up with hard wax, sloping the wax base from the beveled edges to the eminence of the gum. Remove all from the model, place in the plaster matrix, and shape the wax base to the desired form. Place back on the model to see that the waxing process has been properly done. Make a plaster impression or matrix of both slopes from the center line of the base to the level of the grinding surface piece and sides of the abutment crowns, from which make dies and counter-dies, and swage up the plates and adjust to position in the matrix, and after cleaning in acid, burnish to fit. Remove from the matrix, warm the crowns and remove from the dummy section, wax up the ends of the section so as to leave a wedge-shape space to be filled with investment material, leaving the point of the wedge-shape space on the buccal side. After shaping the wax to proper conformation insert a piece of plate extending from the surface of the grinding section piece to the point of the base. Cut the partition pieces one-eighth inch longer than will fill the space, and turn that much out parallel with the grinding surface to be engaged by the investment. Invest, and when sufficiently hard make an opening in the plate on the lingual side one-eighth inch wide, and as long as the case in hand may require, turning the flap of the plate back at right angles to the side. Wash out the wax by pouring boiling water into the opening. When partially dry put "fluxine" in, in sufficient quantity to flux all joints and inner surface.

When the investment is sufficiently dry, heat up from underneath and feed in 20-k. solder. When the matrix is about full, finish up with 22-k. solder, and when about full push the flap of the plate back to place, and if necessary add a piece or two of solder to make it flush at that point. Cool off, pickle in acid, and roughly stone off the soldered point. Make openings in the lingual side of the dummy section for uniting to the crowns. Again invest for soldering, leaving only the two openings exposed, and unite the parts with 20-k. solder, finishing with 22-k.

As a rule I make the reinforcing of crowns in bridge work the final soldering, which is done as follows: Invest the bridge with only the open ends of the crowns exposed, heat up from underneath

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as before, placing the solder mostly on the side of the crown next to the dummy section, which when fused will flow to the opposite side.

The bridge constructed of copper and only waxed together is different from the one just described, in that it contains a porcelain facing, to demonstrate that where the bite is sufficiently long, facings may be used for either upper or lower back sectional bridges, though in the lower I cannot see that anything is to be gained by the use of facings, as that portion of the bridge is not exposed to view, and the contour of the face is not affected by their absence.

I will mention that the abutment crowns of this bridge are a reproduction of the natural teeth by the seamless method, the manner of construction being as follows: The teeth were banded with copper strips, fitted properly to the neck and extending to the base of the cusps, and burnished closely to the crowns. An impression was taken in modeling compound. The matrix and band were filled with plaster, and while soft a metal pin (the size of those in rubber teeth used in the seamless system) was placed in the plaster with the end projecting. When the plaster had hardened, the compound and band were removed, giving a good model of the teeth, which were then wrapped with tin foil well burnished to the tooth model, giving practically a metal tooth over which to run a matrix for swaging the crown. The molar teeth not being mutilated by splitting the matrix, I am enabled to present it for your inspection.

Any abnormal occlusion may be built up on the model with plaster, carved up to the proper occlusion, and reproduced by the seamless system.

In using porcelain facings on this style of bridges, should more than one facing be required, all should be backed up on a single strip of plate in the following manner: Grind the cusps of facings off to a straight line beveled from outer to inner edge, and adjust to close contact with the grinding surface. Take an impression of the outer surface of the facings and abutment crowns, forming a matrix on which to back up the facings. Remove the facings and place in position in the matrix, after shortening the pins to one-half their usual length. Cut a strip of pure gold plate No. 34 gage, of sufficient width to extend to the outer edge of the facings, and of a length to extend well up against the abutment crowns. Place a thin coating of wax on one side of the backing; place in proper position, and press down gently on the plate in order to indicate the points for perforation for pins. Perforate, and adjust to position with the facings in the matrix, burnishing well to the outer edges of the facings. Turn the ends of the backing out to a right angle to the bridge, wax the backing and facings to position under the dummy section, filling the wax well out to contour on the ends between the crowns and facings with hard wax. Wax up the under and lingual surface to proper conformation. Remove all from the model and immerse in ice-water to thoroughly harden the wax. Place in position on the matrix, push the ends of the backing over the wax and against the crowns, and burnish to place on the beveled edge of the grinding surface piece and crowns.

By this method of backing two or more facings, they will occupy the same relative position to the parts as when first adjusted on the model.

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In this shorter piece, one soldering only is necessary to fill the dummy section and unite all the parts.

Another way of reinforcing crowns for bridge work or plain crowns is as follows: After adjusting the crowns to the correct gum line and occlusion, as above described, leave a reasonable space, say one-sixteenth inch, between the line of the crown-prepared abutment to feather-edge or close fit at the neck of the tooth. Cover the abutment with tin foil and burnish to close contact, over which place a covering of platinum foil and burnish to place, fully covering tin foil to the gum line. Place the required amount of very soft wax in the bottom of the crown to fill all space not occupied, and force the crown to place on the abutment, forcing out the surplus wax between the shell crown and platinum lining. Now chill the crown to harden the wax, and remove from the abutments. Remove the tin foil from the platinum lining and with a warm burnisher burnish the platinum well to the inner edge of the shell. Place a small roll of wax on, end down, in the center of the crown so as to adhere to platinum foil, leaving about one-third the diameter of the space next to the grinding surface exposed between the wax stick and the side of the crown. Fill in with investment material between wax and platinum, covering over exterior of crown.

When the investment has hardened, remove the wax stick down to the platinum by pouring in boiling water. Chill the crown in ice-water or cold water, and with a sharp instrument cut out the exposed platinum and renew the pouring of boiling water to remove the wax, to be replaced by gold. To make sure that the wax has been removed from the closest point of contact of the gold side and the platinum lining, hold the crown with the grinding surface over a Bunsen burner flame in order to melt and burn out any remaining portion. Flux well the inner surfaces. Put in solder in small pieces, so as to get it as well down as possible between the two plates of metal. Heat up underneath with the grinding surface up, to fuse the solder and draw it down to the point of contact of the platinum lining and gold band. Place in more solder and work it down as much as possible, re-heat, and fill the space to the top of the platinum. Add sufficient solder to complete the reinforcing by inverting the investment and heating with the grinding surface of the crown next to the flame, and the result will be a strong and durable piece of work.

Dr. J. C. Watkins, Winston-Salem, N. C. "Extreme Mandibular Protrusion."

This clinic consisted in the presentation of a patient exhibiting an extreme case of protrusion of the mandible. The patient, a lady thirty years of age, had some years previously lost the first and second lower molars on each side. There was absolutely no occlusion, and the patient, who was compelled to live on liquid diet, said she felt that for years she "had been gradually starving to death."

This most pronounced case of overdevelopment of the mandible brought out quite an interesting discussion among the orthodontists and others present, most of whom said it was the worst case they had ever seen. It was interesting to note that, while many suggestions were made along orthodontic lines, there was only one dentist who recommended the operation of double resection of the mandible.

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Dr. R. Ottolengui, New York, N. Y. "Orthodontia."

Dr. Ottolengui, with the aid of models, demonstrated the value of the Angle classification as a basis of diagnosis and prognosis. He showed models of a class II case treated late in life in which, after two years of effort, he had obtained no better result than that obtained in two other cases in less than three months, the latter being treated at the ages of seven and eight years respectively. He advocated the earliest possible interference in cases of malocclusion.

Dr. V. H. Jackson, New York, N. Y. "Orthodontia."

Dr. Jackson demonstrated his system of correcting irregularities of the teeth. He showed the method of constructing appliances, first describing how to prepare a model. An accurate model is made and the teeth are carved slightly at the neck, which causes the appliance to fit closely when made, thus insuring good anchorage.

The appliances consist of partial clasps, spring clasps, base-wire, finger-springs, etc., assembled on an accurate plaster model, on which they are finally soldered. Spring-clasp attachments retain the appliance in position by grasping the anchorage teeth. They are made by first arranging partial clasps on the lingual side of the molars and bicuspids used for anchorage. The partial clasps are made of 18-karat gold plate, rolled to No. 36 standard wire gage and contoured with contouring pliers to fit the side of the tooth, usually the lingual side. The gold is roughened on the side on which the solder is to be applied.

The spring clasps are made of No. 21 or 20-gage spring wire, either of gold, silver-nickel, platinoid, or German silver. They are shaped to fit the opposite side of the tooth from the partial clasp near the gum, with the ends passing over the arch, following closely at the junction of the teeth and resting on the partial clasps, to which they are finally soldered. A large wire known as the base-wire or body of the appliance, is shaped to cross the arch following the palatal curve, with the ends bent at nearly a right angle, forming arms. These arms rest on the partial clasps, to which they are soldered with the spring clasps. To this anchorage portion of the appliance, springs of any form are united with solder. They are shaped like fingers for moving any of the teeth in the arch, as desired.

The base-wire crossing the palatal arch is termed a palatal base-wire; when it follows the lingual curve of the teeth a lingual base-wire, and a labio-buccal base-wire when it is arranged to pass on the labial and buccal sides of the teeth in the arch.

Attention was called to the use of chemically pure tin as a solder for uniting the parts of the appliance, rather than jeweler's soft solder, as previously recommended, the absence of lead in the solder lessening the liability of the appliance to tarnish in acid mouths. The solder is flowed with the soldering iron.

The adaptability of the appliances was referred to, describing how the method is applicable for correcting any form of irregularity of the teeth, and for persons of any age. Almost all of the appliances are removable by the patient for cleansing. It was announced that no pain or discomfort to the patient should be experienced. An appliance of this character can be made in about an hour.

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Expansion of the dental arch. Generally the distal part of the arch is broad enough. In such a case, when other portions of an upper arch need expansion laterally, an apparatus is constructed as seen in Fig. 1. A palatal base-wire, about No. 13 gage, is arranged to follow the palatal curve of the arch, crossing the distal part of the arch where it is sufficiently broad. The ends of the base-wire are bent forward and inclosed in the anchorage. Force is developed by bending outwardly the anchorage portions, or the ends of the arms, from time to time, causing the lateral expansion of the anterior part of the arch. When the distal part of the arch is not broad enough, and its expansion is desired, the palatal base-wire is located far back, with the arms extending forward to enter the

Fig. 1.

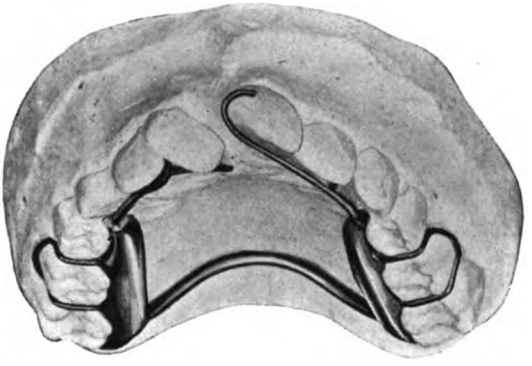
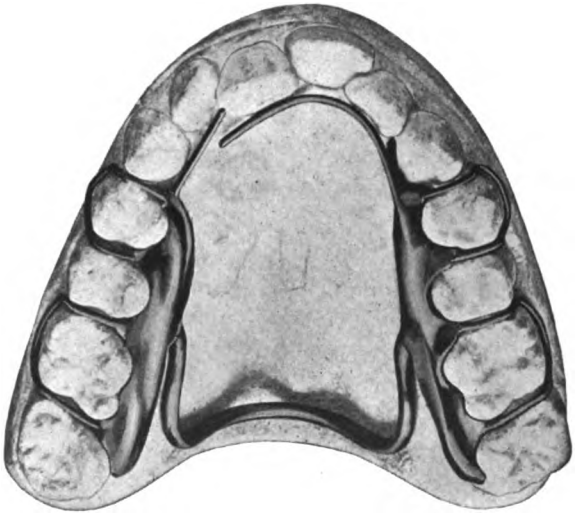


Fig. 2.



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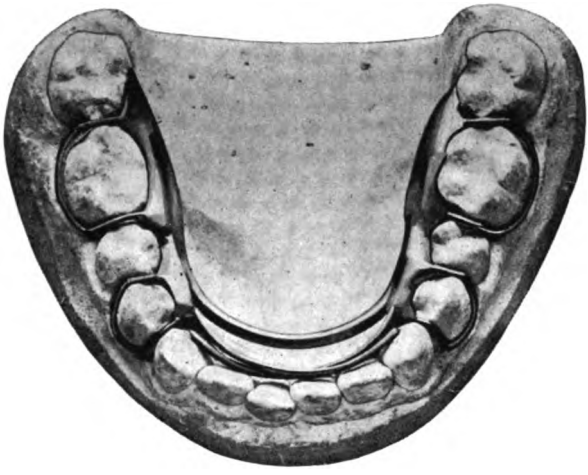
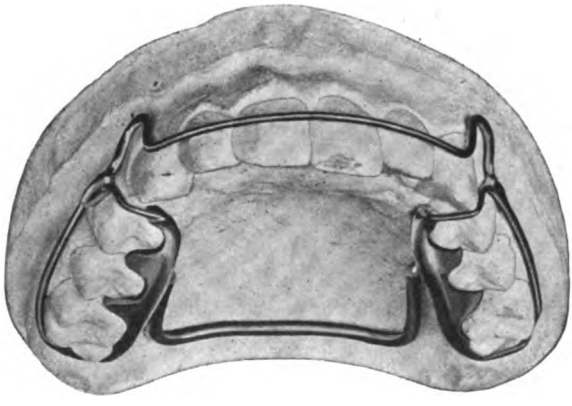
center of the anchorage portions, and properly soldered. (Fig. 2.) With the appliance made in this manner, the dis-

Fig. 3.



tal or anterior portion of the arch can be broadened at will, or the whole arch broadened by shaping the arms of the base-wire as required.

Fig. 4.



In expanding the lower arch, an appliance of the same general principle is employed, using a lingual base-wire with arms extending backward to enter the center of the anchorage portions, as seen in Fig. 3. A similar appliance was used in the case of a boy of seven years, of nervous temperament, in which the disparity in the size of the arches was so great that the teeth of the lower arch closed entirely inside the circle of the upper arch, none of the teeth occluding. The lower arch was expanded laterally, by bending outward slightly, at intervals of one to two weeks, the lateral arms

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of the base-wire. The incisors were forced outward by finger springs extending forward from the anchorage portions, one on each side of the arch. The jaws were harmonized as illustrated in the casts I here present. The same appliance was used for retaining. I would like to ask what other method could have been employed to accomplish this result—expanding the lower arch so extremely, with the deciduous teeth present, without discomfort or the patient shedding a tear?

Contraction of the dental arch. Not infrequently contraction of the dental arch is required. The contraction of the upper arch is accomplished by an apparatus made with either lingual, palatal, or labio-buccal base-wire, according to the movement desired. The palatal base-wire with arms projecting forward is used for contracting the arch laterally by being arranged to cross the distal part of the arch, the arms extending forward to enter the center of the anchorage portions, as shown in Fig. 4.

In place of ordinary spring clasps for anchorage, continuous spring clasps are employed. Force is developed by bending inward the arms of the base-wire. When contraction of only the distal part of the arch is required, a labio-buccal or lingual base-wire can be used. When at the same time the anterior part of the arch needs contraction, a semicircular spring with U-shaped loops is formed to cross the labial side of the incisors. The loops are arranged to project up under the lip, one opposite each canine, and the ends of the spring are soldered to the continuous spring clasps. Force for moving the incisors inward is secured by closing the U-shaped loops. A semicircular spring with U-shaped loops for contracting the anterior part of the arch is also used in connection with a palatal base-wire.

Fig. 5.

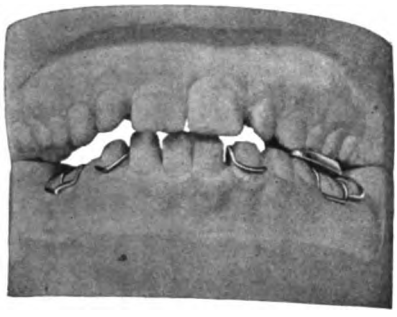
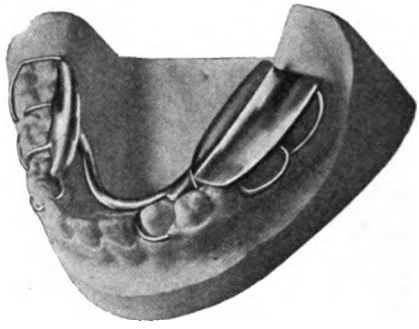


Fig. 6.



Unilateral expansion of the dental arch is the lateral expansion of one side of the arch while the other side is not materially changed. This is accomplished in several ways, as described in my Orthodontia, and in the manner illustrated in Fig. 5. The appliance is arranged to open the bite, and a flange projecting upward as shown in Fig. 6 is made of plate metal No. 22 gage and soldered to the lingual side of the anchorage portion of the appliance, extending from front to back, projecting upward about 3-16 of an inch and fitting the palatal faces of the upper molars, bicuspids, and sometimes the canines, for strengthening the anchorage. It is often necessary to open the bite in such cases as are illustrated in Figs. 5

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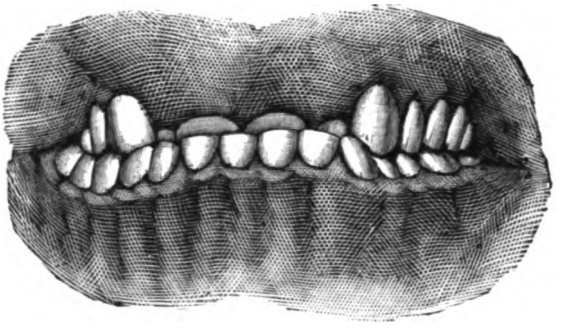
and 7. This is frequently necessary in the treatment of *unilateral occlusion* and when there is an improper occlusion of the incisors.

loops. The spring clasps are passed over the first bicuspids and first molars for anchorage.

The opening of the bite can be begun

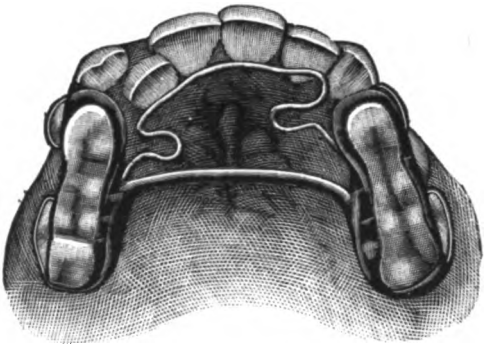
Fig. 7.



Opening the bite. Fig. 7 illustrates a case in which the upper incisors closed back of the lower ones to such an extent as to require the opening of the bite to facilitate their outward movement.

at any stage of the regulation of the teeth at which it is found necessary. For this purpose the appliance is adjusted on the cast, and a strip of plate metal, No. 36 gage or thinner, is placed across the teeth

Fig. 8.



An appliance for moving the incisors outward, and at the same time open the bite, was made as illustrated in Fig. 8. The appliance was removable, made on a plaster cast in the usual manner with partial clasps, spring clasps, base-wire, and a semicircular spring with U-shaped

from before backward. (Fig. 9.) The metal is fitted into the depressions of the teeth as well as may be by successively pressing it gently with a piece of wood or ivory, or a metal instrument, and it need not necessarily be swaged. The ends of the plate metal are then narrowed

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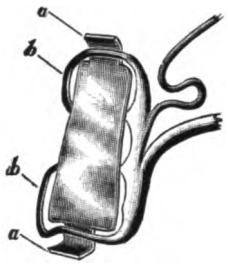
with the scissors sufficiently to permit one end to be passed underneath and doubled around the mesial wire of the spring clasp on the bicuspid, and the

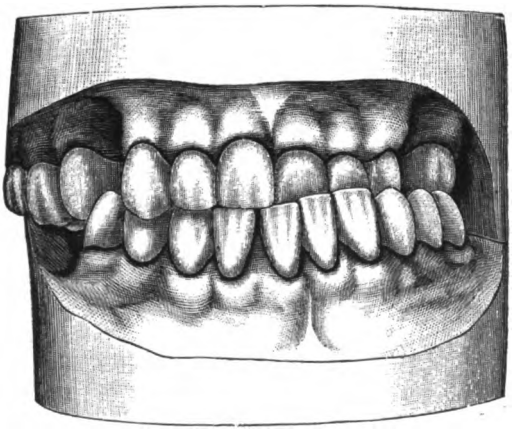
Fig. 9.



other around the distal wire of the spring clasp on the molar. Wax is then built up on this part, and the appliance is inserted in the mouth for the purpose of securing the bite and at the same time to determine how much the upper and lower arches should be separated to permit the upper incisors to be moved outward without interference.

The appliance is then replaced on the cast, the edges of the wax trimmed smooth, and moldine shaped to pass to the top of the wax on one side to form an outline, and the wax removed; metal is then flowed on to the plate, and also large pieces of jewelers' soft solder or pure tin, using the soldering iron. When built sufficiently high the surface of the solder is dressed with a coarse file and the parts are properly finished and polished; or a bar of metal can be soldered to the plate and dressed to form a good occlusion. When the bite is opened in this manner the upper incisors are moved outward by the U-shaped semicircular spring in the usual way, and when they have passed sufficiently in front of the lower incisors the metal is dressed away from the grinding surface from time to time, as much as the position of the incisors will warrant, until it is all removed, which leaves the appliance free, as ordinarily made, permitting all the teeth to rest together in occlusion. The same appliance is used for retaining the teeth when desired.

Fig. 10.



The opening the bite in this manner, when not excessive, does not interfere with mastication or with speech, the appliance is inconspicuous, is suitable for

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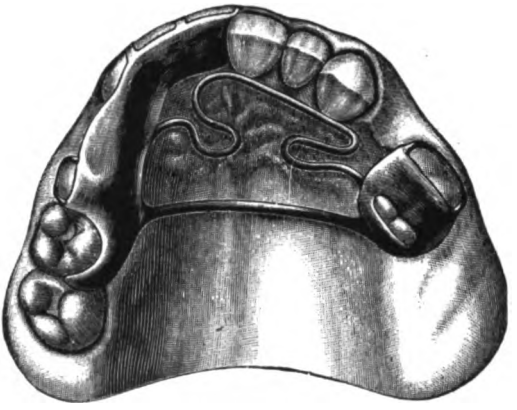
any age and for the correction of any form of irregularity requiring the opening of the bite. A few important cases will now be described.

Unilateral prognathism. Fig. 10 illustrates a case of unilateral prognathism. The age of the patient was forty-one years. The opening of the bite was necessary for its correction.

The upper left canine and the central and lateral incisors closed far inside of the lower teeth, the lower canine and incisors projecting nearly to the upper gum in front of them, and some of the teeth were considerably worn down. Several molars and bicuspids of the upper and lower arches were absent, making it somewhat difficult to secure a good anchorage for the correction of the irregular teeth. A device was arranged to open the bite, in order to thus facilitate the movement of the irregularly placed teeth and at the same time to secure additional anchorage by making possible the attachment of the appliance to the upper incisors and canine on the opposite side of the arch. A spring clasp attachment was arranged over the upper left first molar, the only remaining anchorage tooth on that side, and a spring clasp attachment over the upper right second bicuspid—the first bicuspid having been removed—with partial clasps on the first molar, canine, and lateral central incisors. (Fig. 11.) Small short wires were shaped to pass over the incisal edge at the junction of the central incisors, lateral, and canine, resting on the partial clasps, with the ends on the labial side extending perpendicularly toward the gum to assist the anchorage and to prevent the appliance from being dislodged during mastication.

The sides of the device were connected by a palatal base-wire. A semicircular spring with two U-shaped loops was arranged with the ends extending to the anchorage portions. All of the parts were united with solder. The bite was opened by building additional solder on the partial clasps on the incisors and canine, which had been left unusually broad, and two strips of plate metal, one extending from the canine across the space and over the bicuspid, and the other over the molar

Fig. 11.



on the opposite side of the arch. The bite being opened in this manner did not interfere with mastication, and permitted the outward movement of the instanding teeth when force was applied by means of the looped spring. The anterior part of the spring was retained by a lug on a collar cemented to the canine. The regulating was completed in a limited time and with no special discomfort to the patient. In Fig. 12 is seen the position of the teeth, and the partial upper and lower plates which served for retaining the teeth and which filled the vacancies in place.

Impaction of bicuspids. I now present models of the case of Miss B., age eighteen years. The arch required anterior

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expansion, moving forward the incisors, canine, and left first bicuspid sufficiently to admit the second left bicuspid, which was erupted entirely inside of the line of the arch, the first bicuspid resting next to the first molar as shown in Fig. 13, which also illustrates the style of apparatus used for the correction. It was made with a lingual base-wire anchored by partial clasps and spring clasp attachments. The base-wire was curved downward and inward opposite the irregular bicuspid. To obtain space for it, a looped spring about No. 18 gage extended forward from the anchorage to the molars, passing around the lingual side of the instanding bicuspid, and being curved over the arch to the buccal side, back of the first bicuspid, resting on the distal surface. Another spring was arranged on the lingual side to rest below this for forcing the bicuspid outward as space in the arch was made for its accommodation. A long finger spring extended from the anchorage on the right side of the arch and rested on the lingual surface of the incisors and canines for moving them outward. The free end of this spring

Fig. 12.

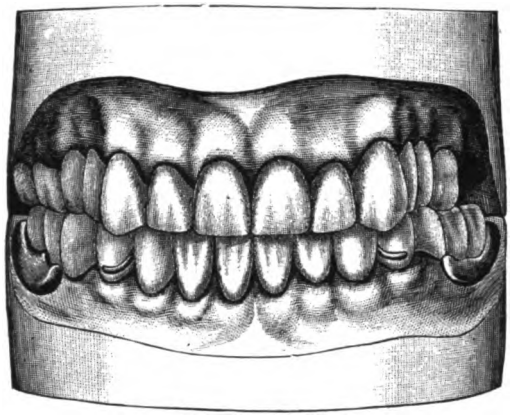
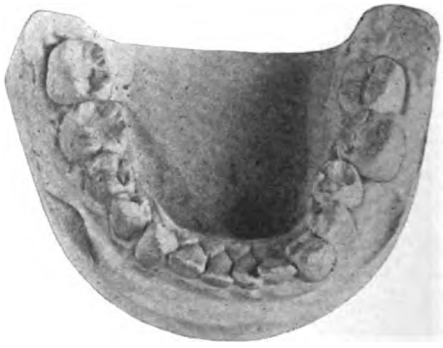


Fig. 13.

Fig. 14.



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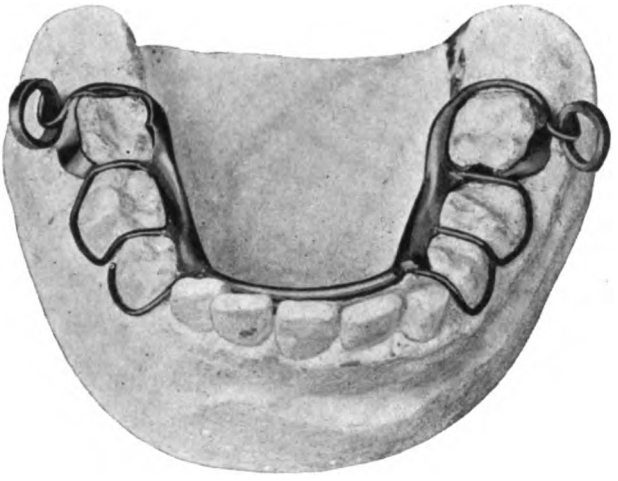
was finally supported by a lug on a collar that was cemented to the left canine. Force was caused by bending forward and outward the ends of the springs.

Cast No. 14 illustrates the condition of the arch after fifteen visits, space having been obtained and the bicuspid moved outward nearly to position.

A *tracing* of the appliance is first made. In this manner the force of the springs of the appliance are in control, moving the teeth only as far as it is planned to move them—making orthodontia an exact science. The extent of the movement of the springs is determined by first laying the appliance on a paper or thin piece of cardboard and tracing its outlines by the use of a sharp-pointed pencil, making a drawing or chart. A mark is then made beside each spring, indicating the distance that they are to be moved for causing force; then the springs of the appliance are bent to conform to the marking. At subsequent visits, when changes in the form of the springs are desired, other marks are made indicating the distance the springs are to be bent and the date of the change noted.

Equalizing the dental arches. I am often asked how I equalize the arches. Of course the method employed is governed by the requirements. In case of extreme upper protrusion with receding lower jaw, and for the correction of prognathism, rubber elastic equalizing bands are sometimes employed. For upper protrusion, an appliance is anchored to the teeth of the lower arch by partial clasps and spring clasp attachments (Fig. 15), and a hook attached to the apparatus in the distal part for a rubber equalizing band that extends to a similar hook on the anterior part of the apparatus in the upper arch. Sometimes, in place of a spring clasp attachment passing over the last molar, especially when it is not well erupted, the anchorage is improved by soldering a wire to the anchorage portion of the appliance opposite the linguo-distal surface of the molar. The wire is shaped to pass back of the molar and curve forward to rest on the buccal surface, form-

Fig. 15.



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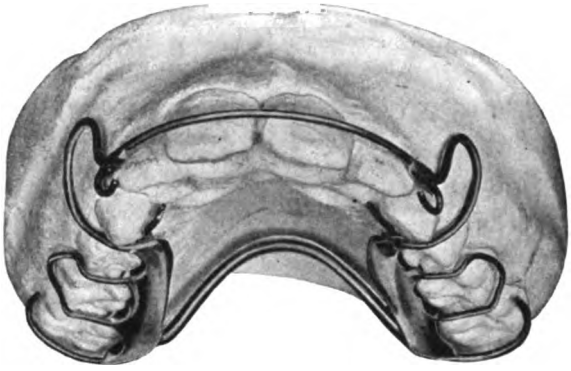
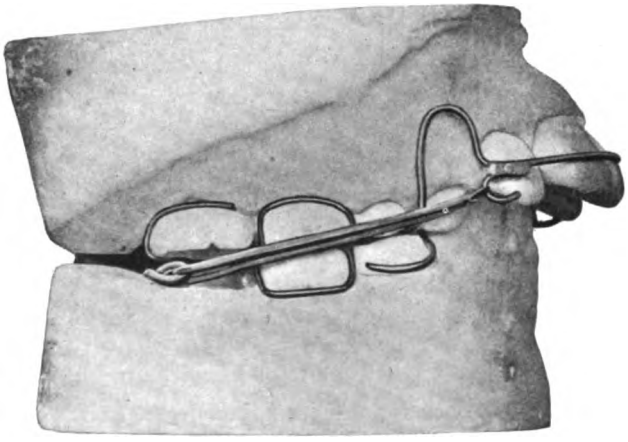
ing a wire clasp, one at each side of the arch. The end of the wire is bent backward on itself sufficiently to form a hook for the attachment of a rubber band; or

Fig. 16.



a separate wire in the form of a hook can be soldered to the end of each of the wire clasps. In case the last molar tooth is not well erupted, the anchor-

Fig. 17.



age is strengthened by cementing to the tooth a collar with a slight metal lug on either buccal or distal side, the lug being located on the collar so that it will project a little over the wire clasp, to prevent it from rising up when force is applied by the traction of the equalizing bands. When additional support of the appliance in the anterior part of the arch is required, a collar with a lug to project over the base-wire can be cemented to one or more of the incisors. An appliance made in this manner is readily removed by the patient, by first pressing outward and backward the wire clasps with the finger, unlocking them from the lugs. This means of anchorage permits and insures thorough cleanliness of the apparatus and the teeth.

An appliance adjusted to the teeth of

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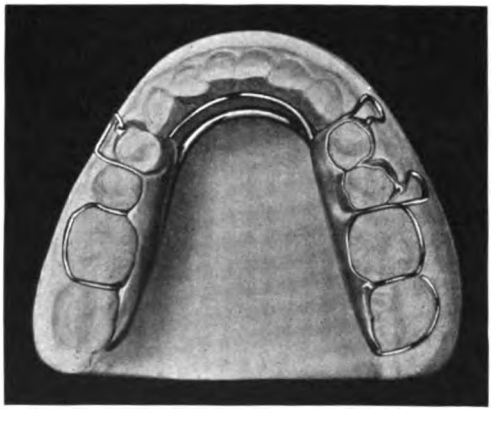
the upper arch is made similar to Fig. 16. Or a collar with a lug on the buccal surface should be cemented to each of the canines and the wire made to extend from the anchorage portion on the lingual side over the arch at the junction of the canines and lateral incisors to the buccal side, where it is shaped to rest above the lug and terminate in a hook to hold the equalizing band.

the *Dental Cosmos,* vol. xlviii, 1906, at page 1091.

Rotation of incisors, bicuspids and molars. Rotation is often required to bring about a correct interdigitation of the teeth in occlusion. Rotation can be easily caused at the same time that other movements of the teeth are being made, as *e.g.* expansion of the arches, equalizing the arches, etc.

Fig. 18.



When the appliances are properly adjusted, one or more equalizing bands are stretched from the hooks of the lower appliance to those of the upper on each side of the arch, as shown in Fig. 17.

It often occurs that the equalizing of the arches is required only on one side, when on the other side of the teeth of the upper and lower arches may require the jumping of the bite. For this purpose, the rubber equalizing bands are used only on this side of the arch, and to further facilitate the correction of these conditions the regulating appliance should be so warped by bending the base-wire as to pull forward on one side of the arch and backward on the other side. Apparatus for this purpose is shown in

In making the apparatus to be always removable by the patient—a thin collar with a hook-shaped lug on the buccal side should be cemented to each of the teeth to be rotated. A spring wire, about No. 19 gage, is usually arranged to extend from the anchorage portion of the appliance over the arch at the junction of the malposed tooth with an adjoining one, from the lingual to the buccal side, where the spring is formed into a U-shaped loop about one-fourth of an inch long projecting under the lip. The free end of the wire is made to engage with the lug on the collar, the end terminating near the grinding surface of the tooth. Fig. 18 shows an appliance arranged for the rotation of three

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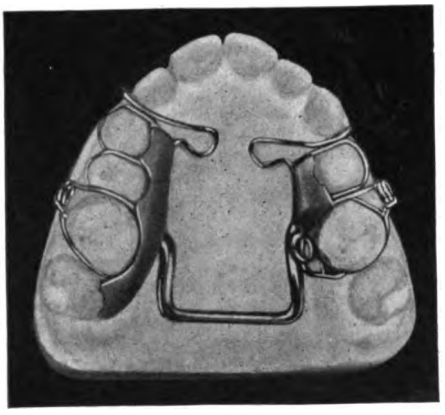
lower bicuspids, at the same time expanding the arch.

Fig. 19.



Force is caused for rotating the tooth in either direction by bending the free end of the spring backward or forward according to the direction of the force desired. Additional force is caused by changing the shape of the spring about once a week. In adjusting the apparatus the patient hooks the end of the spring over the lug.

Fig. 19 illustrates an appliance for the bucco-distal rotation of the upper first molar on each side of the arch, right and left, at the same time moving forward the incisors to cause room for teeth not erupted. In order to make the spring more active, the end of the loop portion is sometimes bent into a complete circle or coil, with the end of the spring extending to engage with the lug as described. (See the illustration—Fig. 19.) In moving the apparatus the patient first disengages the end of the looped springs from the lugs.

If additional force be required at any time, two springs can be utilized for the rotation of a tooth—one arranged to rest against a lug on the buccal side of the collar, and the other on the lingual side, as shown in the illustration. In such a case no partial clasp would be employed on the tooth being rotated.

Fig. 20.

Any number of teeth can be rotated at the same time.

Impaction of canines is generally treated by making a space for their free eruption. This was found necessary

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in the case illustrated in Fig. 19 and also in the case shown in Fig. 20. The force for increasing the space for the canines is usually caused by attaching one end of a U-shaped loop in the anchorage portion of the appliance opposite the first and the second bicuspids with a loop pointing toward the median line of the arch, with the other end of the loop extending outward, back of the canine to the buccal side of the arch. The opening of the loop only a little at a time causes the necessary force and gradually makes the required space to relieve the impacted canine.

FIG. 21.

Depression of incisors. An appliance for the depression of incisors is shown in Fig. 21. The appliance is generally anchored to the teeth of the upper arch. After the anterior part of the upper arch is properly expanded by bending outward from time to time the anchorage portions of the appliance, or ends of the arms of the base-wire, a metal shelf is attached to the anchorage portions, being arranged to follow the lingual curve of the upper incisors. The shelf is usually supported to resist the force of the lower incisors and canines in occlusion, by attaching to it, with solder, loop-shaped wires arranged to hook over the points of the canines.

The shelf is tipped forward at an angle if it be desired that the lower arch or the incisors are to be moved forward. When the upper incisors and canines need to be depressed in their alveoli, thin narrow pieces of plate metal bent into the form of a hook are soldered to the anterior part of the shelf, each of them to hook over the incisors. The hooks are shortened from time to time, as desired, to cause more force by banding with pliers.

Dr. S. W. BOWLES, Washington, D. C.
"The Greenough Microscope."

Dr. Bowles exhibited the Greenough dissecting binocular microscope, with certain accessories which he had devised in order to adapt the instrument to dental uses. His attention had been directed to the instrument and the possibility of its use in dentistry by Dr. David Fairchild, in charge of "foreign exploration" in the Bureau of Plant Industry, Department of Agriculture, at Washington.

The instrument was not an ordinary microscope, but had certain novel features of construction and adaptation which made it an entirely new and original type. It is the invention of an American biologist by the name of Greenough, and its construction was worked out in the famous optical works of Carl Zeiss at Jena, Germany, which firm is the only one at present that manufactures it.

Dr. Fairchild gives the following description of the instrument:

"It is a dissecting microscope, and does not invert the image as the ordinary microscope does; in other words, you can work with your instruments under it without learning that in order to touch a spot in the right of the field you must move your hand to the left instead of to

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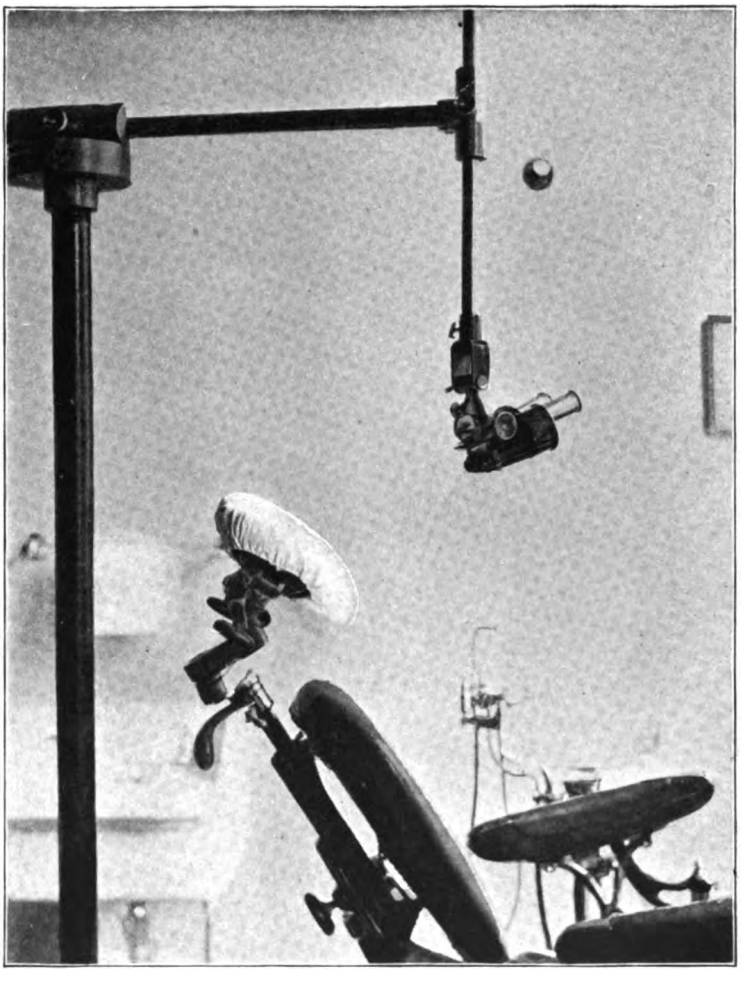
the right, as you would naturally do. This one difficulty in the old type of microscope has effectually barred it from use in the mouth.

Fig. 1.



"It is a binocular, and at the same time a bi-objective microscope. The old binocular microscopes were none of them bi-objective—that is, none of them had two objectives. The Greenough is essentially two separate microscopes fastened together in such a way that they give stereoscopic vision. This stereoscopic vision is one of its most remarkable features, and makes it rank beside the oil immersion objective as an instrument of research. I think that this character of the instrument will appeal to all in dentistry who are familiar with the ordinary microscope, and who know how shallow is the layer of any object which is in distinct focus at any one time. By means of the two separate objectives Greenough

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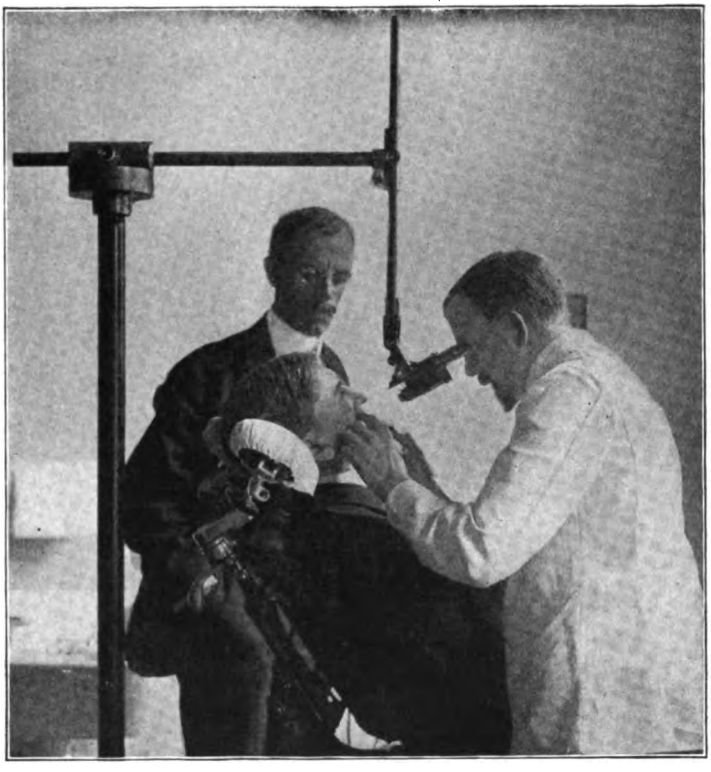
has overcome this difficulty to a large extent, and objects which under an ordinary microscope can only be seen in sections by focusing down from the top, are under this marvelous new instrument visible in their entirety. In dental examinations this feature is of the very first importance, because it is the relation of the form and size, rather than the character, of a flat but small section of a cavity, that is important.

"The instrument has the most remarkable 'working distance' of any microscope known; in fact, this point alone is what at first attracted my attention to its possibilities in dentistry. With objectives that magnify from eight to sixty-five diameters—that is, which are four to thirty times as strong as the hand magnifiers that dentists usually employ—a distance of from an inch and a half to four inches intervenes between the objective and the teeth. This distance is enough to allow any of the ordinary dental instruments to be used.

"There is attached to this microscope a small electric light and a reflector that throws a beam of light on the precise spot that the objectives are focused on, thus illuminating it perfectly. The eyepieces are quite as adjustable as are those of the Zeiss field-glasses, so that by moving them back and forth the fields of vision can be made to appear as one single field.

"The instrument is light and easily

FIG. 2.



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manipulated, requiring little of the technique which the old microscopes demanded, and already it has entered the field of the plant-hybridizer, and is being used by gardeners who never in their lives saw through the ordinary microscope.

"In botany—especially in the study of plant diseases—it has quickly become invaluable; while in metallurgy, zoölogy, and in many other branches, it is rapidly becoming quite as necessary an instrument of research as is the old microscope. It has revolutionized the study of corals, I am informed, and the entomologists say that it has revealed entirely new characters in insects.

"I believe that could we get the instrument in position to look into the mouth of a patient in the chair, its own wonderful revelations would win for it the place it deserves to occupy in the art which of all others demands attention to the minutest details. I cannot help feeling that it is to play an important rôle in the future of scientific dentistry."

The illustrations, Figs. 1 and 2, show the construction of the standard and supporting arm for the microscope as devised jointly by Dr. Fairchild and Dr. Bowles. The standard rests on a heavy metal base, built so substantially that it is rigid enough to keep the instrument in focus. It permits of eight movements, enabling a perfect focus to be easily and quickly obtained. When the focus is once obtained, the horizontal arm can be swung entirely free from the patient and returned to the same focus at will. When all set-screws are tightened, the operator can rest the forehead against the eyepieces, leaving both hands free for work if desired.

I wish to call your attention in the pictures to the "working distance"—that is, the distance of about five inches between the nearest point of the instrument to the patient and the cavity or teeth in focus. This is one of the main points which is particularly useful to us. Another strong point in its favor is that the image is not reversed. These two extraordinary attributes permit the use of instruments which are magnified as well as the tooth, and actual work upon the teeth can be done under it if desired.

The last important point is the depth of the layer which is in focus. What this last point means can be illustrated by the case of a lower second molar from which the pulp had been removed. Access to the pulp-chamber was afforded through an occluso-mesial cavity. The canal in the posterior root and one in the lingual portion of the anterior root were easily located. It was believed that a canal existed in the buccal portion of the anterior root, but it could not be found with a broach. The microscope was then focused on the tooth, and the first look was a revelation. The whole tooth was in focus; not only this, but the entire extent of the cavity. It was quickly discerned by the formation of the dentin in the region of the suspected canal that one had existed, and a little drilling opened into the canal and a considerable portion of pulp was removed. The microscope had rendered the operation quick, easy, and precise.

The instrument is invaluable in finding exposed pulps without shocking the patient by using broaches and explorers; also, in lifting out partially decalcified dentin, which comes away in a leathery mass from deep cavities, it will prevent injuring the pulp. When a pulp is nearly exposed, it will quicken our judgment as to whether dentin should be left to recalcify. By using this microscope after a cavity has been prepared, any softened

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structure which has been left can be detected, and weakened enamel prisms may be clearly distinguished. It is like proving a mathematical problem, and removes most of the uncertainties of cavity preparation.

Many difficult features of a critical examination of the mouth are minimized, if not entirely cleared away, by the use of this microscope. It can be clearly seen whether discoloration around a filling is due to faulty margins and recurring caries or whether it is caused by staining of tooth-structure by the filling material. Imperfect margins can be seen when an explorer passes over them, and small approximal cavities can be found in interdental spaces where it is impossible to pass an instrument, and where a slight separation is necessary to make sure the presence of a cavity. More than this, in interdental spaces where instruments can pass and detect nothing, the microscope will reveal areas in which the cement substance of enamel rods has been dissolved in the first stage of enamel caries.

By the use of the electric illuminating apparatus, observation can be made on the molars nearly as perfectly as on the anterior teeth. For the distal surfaces of molars it is of course necessary to employ a plain mouth-mirror in order to secure the image upon which to focus.

Professors and demonstrators of operative dentistry would find this microscope a wonderful assistance in the teaching of the branch. The present method in vogue is most excellent, but its one weak point is a flagrant one. It is this: Students obtain their first knowledge of cavity preparation from large technic models. The size of cavities prepared in the models are so out of proportion to the same class of cavities in the mouth, that the first work of students in the infirmary is apt to be destructive of good tooth-substance. Now, if a student could see a properly prepared cavity through the microscope, and have the salient points clearly shown, it would undoubtedly go a long way toward overcoming the embarrassment now experienced, and would benefit both student and patient. Besides its unique possibilities in the mouth, the Greenough microscope is specially adapted to research work in the dental world.

The belief is that its use will open up new avenues of research, and be an immense contribution to exact methods and scientific dentistry.

Dr. W. H. DeFord, Des Moines, Iowa. "Somnoform: a Clinical Lecture."

Dr. DeFord claimed that somnoform must be a safe anesthetic because only three deaths have occurred in a million administrations, and no one has said that the anesthetic produced these mortalities. It is also pleasant to take, because when administered correctly nausea occurs only in about one per cent. of cases unless blood be swallowed, and then it is the blood that produces the nausea, not the somnoform.

Somnoform induces a profound anesthesia. In more than 3500 administrations Dr. DeFord has never had a patient complain of feeling pain during the operation.

It is a convenient anesthetic, in that the patient is able to vacate the chair as quickly as if no anesthetic had been administered, and it is also desirable in that supervening headache is so rare as not to be taken into consideration. Only

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in a few instances have patients rested in the office after taking somnoform, and these were cases in which the patients were worn out physically from pain and loss of sleep, and would have collapsed had the extraction been done without an anesthetic.

Somnoform is a handy anesthetic, in that it is always ready to use. It takes up no room in the office, and if it be necessary to go to the home of the patient, you can grab it and run. It obviates the unpacking and repacking of cylinders. One never knows how much nitrous oxid a cylinder contains, and the clinician has been defeated often in an operation when there should have been fifty to seventy-five gallons of nitrous oxid in a cylinder, and has had it give out when a patient was just short of being anesthetized. No annoyance of this kind can happen with somnoform.

In brief, somnoform is almost an ideal anesthetic, more nearly perfect than he had dared hope to see during his lifetime. In more than 3500 administrations—taking patients just as they came, without previous preparation—he had never witnessed what he would consider a dangerous symptom, and had only seen nine cases of nausea where blood had not been swallowed. These cases included the extraction of teeth, removal of fingers, tonsillotomies, ingrowing toe-nails, various uterine operations, enucleation of eyes, etc. He called attention to the fact that somnoform was valuable to the dental surgeon not only for the extraction of teeth, but in all the painful conditions the dentist is called upon to treat.

Dr. DeFord explained the use of the inhaler, showed how to administer somnoform, and gave much valuable information gained from his wide experience with it.

A. J. Wright, L.D.S.Ed., Perth, Australia. "Clinic on Anesthetics."

This demonstration will be with nitrous oxid and ethyl chlorid. Possibly this is the first time any present have seen any anesthetic given absolutely by time. Before proceeding further, let me say that Dr. W. Guy, F.R.C.S., L.R.C.P., L.D.S., dean of the Dental College, Edinburgh, was the originator of this method, and this is the apparatus [exhibiting] introduced by him. It consists of a Bath three-way stopcock and face-piece, a one-gallon gas-bag, and a ball-joint tube to which is attached a graduated glass measure to hold the ethyl chlorid.

I have both seen this administered and have also given it myself in a very large number of cases. Where an anesthetic is required that will give you a longer time than gas only, I know of no better one than this mixture, which will give you from 75 to 150 seconds; in one hundred cases the time averaged 98 seconds. At first sight this method did not appeal to me as being scientific, as most anesthetists will say that you cannot fix a time limit for an anesthetic, but after seeing so many cases I have been led to alter my opinion.

We are all agreed, I presume, that the safest plan in giving an anesthetic is to give the smallest quantity that will do for our requirement. By this method we never exceed one gallon of gas and three cc. of ethyl chlorid. If less ethyl chlorid will do, we give less. For instance, with a child we sometimes give 1½ cc., or for an adult, where we have only a few extractions, 2 or 2½ cc. But this can be judged after using for a while. On no occasion, however, do we exceed 3 cc.

The method of giving this mixture is as follows: Have your patient sitting in an almost upright position, and looking

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straight to the front; lock the fingers together in front, and be careful to have them blow the nose and clear the air-passages for breathing. Now proceed by allowing the patient to breathe the nitrous oxid, backward and forward, into this one-gallon bag for four or five inhalations. Then tell the patient not to mind the smell, and tip in the ethyl chlorid, having someone to take the time for you from the first inhalation after the ethyl chlorid has been tipped in. After twenty-five seconds have elapsed, remove the face-piece, and proceed at once to operate. In the case of a child the time may be reduced to twenty seconds.

Mr. Wright here administered the anesthetic to several patients and also extracted several teeth. The duration of anesthesia in these cases varied from one and one-half to two and one-quarter minutes. All present were greatly interested, and several questions were asked:

(1) Had Mr. Wright seen any case in which the patient was not anesthetized? Answer: He had seen one or two, but this was explained by the temperature of the room, which on this occasion was below 60° F. It is necessary that the temperature be not less than 70° F. The necessity for this is that it takes the ethyl chlorid twenty-five seconds to evaporate, and it is stated also that in that time a red blood corpuscle will twice pass a given point; therefore, the blood coming into contact with the ethyl chlorid twice, and all the ethyl chlorid in the bag being evaporated, if one proceeds further the patient becomes asphyxiated.

(2) Had Mr. Wright ever observed nausea as the result of its administration? Answer: He had seen it in one or two cases, but this he had also seen with gas alone, so he did not attribute it to the ethyl chlorid.

(3) Do the patients ever become hysterical? Answer: Not more so than with gas; you will get hysterical symptoms when the patient is very nervous or alcoholic.

(4) Do you ever repeat the anesthetic at the same sitting? Answer: No.

(5) What advantages has this apparatus over any other? (*a*) It may be used for gas with the backward and forward breathing. (*b*) It may be used for gas with in-and-out breathing. (*c*) It can be used for gas and ethyl chlorid. (*d*) It can be used for ethyl chlorid and ether, the mixture consisting of 3 cc. of ethyl chlorid and 3 cc. of ether, put into a graduate tube, well shaken together, and given similarly to the gas and ethyl chlorid—the difference being that with about six inhalations of backward and forward breathing of gas, the mixture is then tipped in, continue for thirty-five seconds, which will secure anesthesia for from two to three minutes. (*e*) It can be used for gas and somnoform. (*f*) It can be used in connection with Clover's inhaler, either by getting the patient well under the influence of the gas and then adding a little ether, or by giving a little gas and then proceeding to the full anesthesia with ether.

Therefore we have here a small unique apparatus that will meet every anesthetic requirement for dental operations, whether one-half minute or fifteen minutes be required.

Dr. E. A. Perry, Littleton, N. C. "Chloroform — Stimulating Stage — in Dental Operations."

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The clinician demonstrated the removal of sensitive dentin and exposure of the pulp without pain by the use of chloroform inhaled to the stimulating stage. The chloroform is administered very slowly at first, allowing the patient to breathe plenty of air with it. As soon as the patient becomes excited, or happy, the decay may be removed or the pulp exposed, as the case may be, without the least discomfort to the patient.

When the pulp is to be removed, cocain dissolved in oil of cloves is used—the oil of cloves preventing any septic conditions at the apical foramen. Used in the anterior teeth the cocain and oil of cloves combination, the clinician claims, will check all hemorrhage and cause the operation to be bloodless, unless it be a highly congested tooth that has given trouble for some time.

Dr. G. W. Cochran, Erie, Pa. "The Surgical Treatment of Chronic Alveolar Abscess, Associated with More or Less Necrosis."

Some varieties of chronic alveolar abscess do not respond to conventional treatment. Chronic alveolar abscess (in cases where the pus sac is not too much decomposed) ordinarily yields to canal treatment such as all practitioners are familiar with; the major portion of these (possibly 85 per cent.), with our approved canal treatment, apparently get well. There are, however, a minor proportion of cases that remain obstinate and refuse to be cured with our best efforts at canal and sinus treatment, notwithstanding we may have established a thorough drainage. It is more particularly in this obstinate variety that the clinician wishes to impress upon the mind the advantage of the surgical treatment of such cases.

Affection of the bone due to dissolution of cyst. The clinician cannot make himself believe that true alveolar necrosis associated with dental pus sacs is ever established or found to be present prior to the rupture or dissolution of the cyst—or, in other words, until the sac becomes thoroughly rotten. Common knowledge of the anatomical surroundings ought to make it readily comprehended how very easy it is for the pus micro-organisms to invade the porous or cancellated bone structure of the mandible or maxilla after the pus sac is ruptured, and this accounts in a very large measure for the absence or total disappearance (in many chronic cases) of the sinus or the gumboil. The pus sac having decomposed, pus is no longer confined within a pouch, but is more or less diffused throughout the cancellated bone structure, thus establishing genuine decay of the bone and a gradual diminution of the individual's *vis vitæ* directly due to pus absorption.

The clinician has been practicing this surgical procedure in obstinate alveolar abscess conditions for the past fourteen years, and has been rewarded with a large measure of success. Previous to this surgical procedure many chronic "alveolar abscess" teeth in the clinician's practice were extracted on account of inability to cure them through canal and sinus treatments.

The purely surgical method. The case being properly diagnosed and the patient anesthetized (either systemically or locally with cocain) and the field of operation sterilized, one proceeds to make an incision above or below the root apex, as the case may be. In this clinic it was a lower left second bicuspid with dis-

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charging pus tract or sinus that was operated upon.

Curette the necrosed portion thoroughly with a large vulcanite bur and suitable spoon-shaped excavators. Should one have exostosed, obtuse-angle or right-angle root-apex curves to contend with, a straight apical root amputation would be required—with a bur designed specially by Dr. Schamberg, which is most useful for this purpose.

The clinician contends that no dentist or oral surgeon has ever existed, or will ever exist, who can retain the above-mentioned class of chronic abscessed teeth short of surgical procedure. It is beyond human ingenuity to so skilfully manipulate nerve-canal reamers and canal broaches as to extirpate and enlarge these obtuse and right-angle curves about the apices of tooth-roots; a very small portion of unexplored and therefore unfilled canal remains, and is sure to develop infection; and he asserts without fear of contradiction that no tricresol, formagen, or any other mummifying preparation can be inserted in the apices of these canals and maintain quiescence for an indefinite period. In a brief time these antiseptic preparations spend their germicidal properties.

After-treatment. The wound or necrosed pocket having been properly curetted, a Berlin abscess syringe and hydrogen dioxid three per cent. is used to irrigate through the canal (should it be open), and the wound is packed or dressed with five per cent. iodoform gauze, the tooth-canal dressed with cotton, and aromatic iodoform hermetically sealed in; no saliva should gain access in the future to the canals of teeth thus treated. The tooth and curetted pocket require daily irrigation with a good antiseptic—glyco-thymoline twenty-five per cent. is used almost exclusively for this irrigating purpose—and the pocket is repacked or dressed with gauze for the first week or ten days, in extreme cases, and thereafter less frequently. Teeth operated upon in this manner usually recover, and can safely be dismissed in from three to six weeks, depending entirely upon the extent of the lesion and the individual's vitality and recuperative powers.

The clinician has had a few extreme alveolar necrosis cases requiring a full year's time to fill in new granulation; such cases are only found in individuals of a low degree of vitality, where nature is slow in effecting repair.

In performing this operation, do not lose sight of the fact that it is extremely necessary that no unfilled canals should remain about multi-rooted teeth. Also that thorough surgical cleanliness must be maintained throughout the whole procedure, even to the irrigating, repacking or dressing of the wound. If the pocket or wound be not kept loosely packed with five per cent. iodoform gauze, the orifice of the wound will close rapidly, making it impossible for proper granulation to take place. In other words, a non-septic cyst is likely to be established that in future is pretty sure to again become infected, causing a recurrence of the former lesion. In the opinion of the clinician, all who wish to perform successfully this special surgical procedure should be thorough in curetting, give special attention to root-canals, and observe the proper requirements in after or subsequent treatments.

Dr. T. A. HARDGROVE, Fond du Lac, Wis. "Pyorrhea Alveolaris with Tooth-Replantation."

Dr. Hardgrove began his clinic with a

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careful examination of the field of operation, and the anesthetizing of that field with a one-half of one per cent. solution of cocain, applied through a flexible long blunt needle, undertaking next to that a positive removal of all deposits, diseased peridental membrane, and cementum. This was accomplished with a set of Younger's pyorrhea instruments. Following that he floods the field of operation or sinuses with a warm lactic acid solution, full strength, with just a little oil of sandalwood—which aids the lactic acid in the solution of deposits and has a good effect upon the mucous membrane—ligating the teeth with a fine-walled ligature, which if properly placed will remain for a month. The teeth are then allowed to rest until they become tight and comfortable.

The replantation part of the clinic consisted in the extraction of a tooth, the removal of all deposits, dead cementum, and pericementum, slight shortening of the dead end of the root, slight deepening of the socket from which it was extracted, and the replacing of the tooth in it and fixing it absolutely. This is the one thing, after cleansing of the root, necessary to success. The tooth was fixed with bands, and a splint made by mixing cement, shellac, and cotton was pasted over the bands outside of the arch. A cement splint should be placed on the occlusal surfaces of some of the posterior teeth to prevent the replanted tooth being disturbed.

Dr. W. Clay Middaugh, Easton, Pa. "The Use of the Gem Syringe Attachment in Pressure Anesthesia and in the Flushing of Fistulous Tracts."

The "gem" attachment is a concave disk with a hole in the center, intended to be slipped over the needle of any syringe, and to be used as a carrier of packing material—such as soft rubber. Its use in pressure anesthesia was demonstrated in the following manner: Having charged an ordinary barrel-and-piston syringe with a solution of cocain, the attachment was slipped over the needle, which was then pushed through a piece of soft rubber so that the point slightly protruded. The point of the needle was then directed toward the bottom of the cavity, and the syringe was pressed firmly against the tooth. The "gem" attachment seating firmly against the soft rubber made a fluid-tight joint. The point of the needle protruding only slightly into the cavity touched neither sensitive dentin nor exposed pulp, and the contents of the syringe were then slowly and steadily forced into the cavity and against the sensitive dentin and exposed pulp. It was noted that nothing but the fluid came in contact with the pulp, and consequently the first pain of pressure anesthesia was avoided.

That the "gem" is a valuable attachment in the treatment of dental abscess was demonstrated as follows: Having charged an ordinary syringe with the desired medicament, a "gem" attachment of suitable size was slipped over the needle, which was then thrust through a small ball of vulcanite rubber until the point protruded. The needle, thus equipped, was introduced into the cavity or canal of the abscessed root, and pressure having been brought to bear, a liquid-tight joint between the syringe and the cavity was obtained. The contents of the syringe were then forced through the abscessed tract, and emerged at the fistulous opening.

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